

**CLASS 568, ORGANIC COMPOUNDS -- PART  
OF THE CLASS 532 - 570 SERIES**

**SECTION I - LINES WITH OTHER CLASSES  
AND WITHIN THIS CLASS**

In this series of classes, class 568 is to be considered as an integral part of class 260 (after subclass 585) and follows the schedule hierarchy retaining all pertinent definitions and class lines of class 260.

**SUBCLASSES**

**1** This subclass is indented under subclass 1. Compounds under Class 532, ... which contain boron.

**SEE OR SEARCH CLASS:**

588, Hazardous or Toxic Waste Destruction or Containment, subclasses 405 through 409 for the chemical destruction of organic hazardous or toxic waste containing halogen, sulfur, oxygen, phosphorus, or metals.

**2** This subclass is indented under subclass 1. Compounds which contain phosphorus.

**3** This subclass is indented under subclass 1. Compounds which contain two or more boron atoms.

(1) Note. Included herein are, for example, the reaction products of diborane and an unsaturated organic compound.

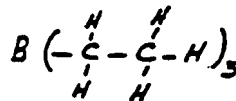
**4** This subclass is indented under subclass 3. Compounds which contain at least ten boron atoms.

**5** This subclass is indented under subclass 4. Compounds which contain sulfur, oxygen, halogen, or a metal selected from Group IA or IIA of the Periodic Table having a specific gravity less than four.

**6** This subclass is indented under subclass 1. Compounds which contain sulfur, oxygen, halogen, or a metal selected from Group IA or IIA of the Periodic Table having a specific gravity less than four.

**7** This subclass is indented under subclass 1. Compounds which contain boron having three acyclic substituents consisting of hydrogen and carbon.

(1) Note. An example of a compound provided for herein is:



**8** This subclass is indented under subclass 1. Compounds under Class 532, ... which contain phosphorus.

**SEE OR SEARCH CLASS:**

588, Hazardous or Toxic Waste Destruction or Containment, subclasses 406, 408 and 409 for the chemical destruction of organic hazardous or toxic waste containing halogen, sulfur, oxygen, or phosphorus.

**9** This subclass is indented under subclass 8. Compounds wherein at least one hydrogen of the phosphonium radical  $PH_4$  is substituted by an organic radical.

**10** This subclass is indented under subclass 9. Compounds which contain at least two phosphorus atoms.

**11** This subclass is indented under subclass 9. Compounds which contain sulfur or oxygen.

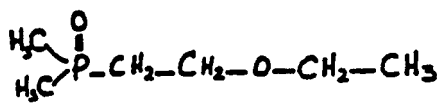
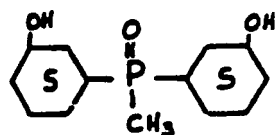
**12** This subclass is indented under subclass 8. Compounds in which phosphorus is a ring member.

**13** This subclass is indented under subclass 8. Compounds which contain sulfur or oxygen.

**14** This subclass is indented under subclass 13. Compounds wherein sulfur or oxygen is bonded directly to phosphorus.

- 15 This subclass is indented under subclass 14. Compounds which contain sulfur or oxygen bonded indirectly to phosphorus.

(1) Note. Some examples of compounds provided for herein are:



- 16 This subclass is indented under subclass 8. Compounds which contain halogen.
- 17 This subclass is indented under subclass 8. Compounds which contain a benzene ring.
- 18 This subclass is indented under subclass 1. Compounds under Class 532, ... which contain sulfur.

SEE OR SEARCH CLASS:

588, Hazardous or Toxic Waste Destruction or Containment, subclasses 405 through 409 for the chemical destruction of organic hazardous or toxic waste containing halogen, sulfur, oxygen, nitrogen, phosphorus, or metals.

- 19 This subclass is indented under subclass 18. Products wherein the sulfur containing compound is mixed with a preserving or stabilizing agent which functions to prevent physical or chemical change.
- 20 This subclass is indented under subclass 18. Compounds which contain a
- 21 This subclass is indented under subclass 18. Compounds which contain sulfur directly bonded to sulfur.

- 22 This subclass is indented under subclass 21. Compounds which contain oxygen.

23 This subclass is indented under subclass 22. Compounds wherein sulfur or oxygen is bonded directly to a ring.

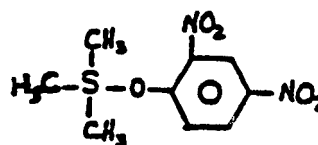
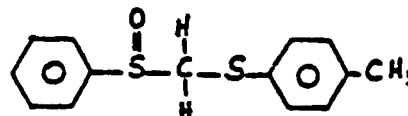
24 This subclass is indented under subclass 21. Compounds which contain halogen.

25 This subclass is indented under subclass 21. Compounds which contain a benzene ring.

26 This subclass is indented under subclass 21. Processes wherein the compound is prepared by reacting a compound containing a -SH or -SM group where M is a Group IA or IIA metal having a specific gravity less than four.

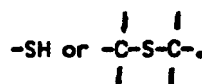
27 This subclass is indented under subclass 18. Compounds which contain oxygen directly bonded to sulfur.

(1) Note. Examples of compounds provided for herein are:



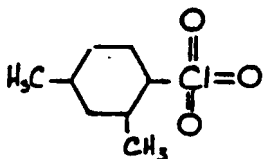
28 This subclass is indented under subclass 27. Compounds wherein at least two oxygens are directly bonded to the same sulfur atom.

29 This subclass is indented under subclass 28. Compounds which contain



- 30** This subclass is indented under subclass 28. Compounds which contain nitrogen.
- 31** This subclass is indented under subclass 28. Compounds which contain a
- 32** This subclass is indented under subclass 28. Compounds which contain oxy.
- 33** This subclass is indented under subclass 32. Compounds wherein oxy is bonded directly to a ring.
- 34** This subclass is indented under subclass 28. Compounds which contain at least two rings.
- 35** This subclass is indented under subclass 28. Compounds which contain at least two halogen atoms.
- 36** This subclass is indented under subclass 27. Compounds which contain nitrogen or at least two sulfur atoms.
- 37.**  
This subclass is indented under subclass 27. Compounds which contain a
- 38** This subclass is indented under subclass 18. Compounds having the R-S-R structure wherein the R's are diverse or identical organic radicals.
- 39** This subclass is indented under subclass 38. Compounds which contain oxygen.
- 40** This subclass is indented under subclass 39. Compounds which contain a Group IA or IIA metal having a specific gravity less than four.
- (1) Note. An example of a compound provided for herein is:
- 
- 41** This subclass is indented under subclass 39. Compounds which contain a
- 42** This subclass is indented under subclass 41. Compounds which contain two organic radicals bonded directly to the carbonyl.
- 43** This subclass is indented under subclass 42. Compounds which contain oxy or halogen.
- 44** This subclass is indented under subclass 39. Compounds which contain nitrogen.
- 45** This subclass is indented under subclass 39. Compounds which contain two or more oxygen atoms.
- 46** This subclass is indented under subclass 45. Compounds which contain two or more -OH groups.
- 47** This subclass is indented under subclass 46. Compounds which contain at least two rings.
- 48** This subclass is indented under subclass 47. Compounds wherein at least two rings are bonded directly to the same sulfur atom.
- 49** This subclass is indented under subclass 45. Compounds which contain at least two rings.
- 50** This subclass is indented under subclass 45. Compounds which contain at least one -SH group or two or more
- 
- 51** This subclass is indented under subclass 39. Compounds wherein oxygen is directly bonded to a ring.
- 52** This subclass is indented under subclass 51. Compounds which contain two or more rings.
- 53** This subclass is indented under subclass 52. Compounds wherein at least two rings are bonded directly to the same sulfur atoms.
- 54** This subclass is indented under subclass 51. Compounds wherein sulfur is directly bonded to a ring.

- 55** This subclass is indented under subclass 39. Compounds which contain an -OH group.
- 56** This subclass is indented under subclass 38. Compounds which contain halogen.
- 57** This subclass is indented under subclass 38. Compounds which contain at least one -SH group or two or more R-S-R groups.
- 58** This subclass is indented under subclass 38. Compounds which contain two or more rings.
- 59** This subclass is indented under subclass 38. Compounds which do not include a ring.
- 60** This subclass is indented under subclass 59. Compounds wherein the R groups in R-S-R are identical acyclic groups.
- 61** This subclass is indented under subclass 18. Compounds which contain a -SH or -SM group where M is a Group IA or IIA metal having a specific gravity less than four.
- 62** This subclass is indented under subclass 61. Compounds which contain oxygen.
- 63** This subclass is indented under subclass 62. Compounds which contain the following group:
- 64** This subclass is indented under subclass 62. Compounds wherein oxygen is directly bonded to a ring.
- 65** This subclass is indented under subclass 61. Compounds which contain halogen.
- 66** This subclass is indented under subclass 61. Compounds which contain two or more -SH groups.
- 67** This subclass is indented under subclass 61. Compounds which contain a benzene ring.
- 68** This subclass is indented under subclass 67. Processes wherein the compound is prepared by utilizing a halogen containing, heavy metal containing, or aluminum containing material in any way, e.g., as a catalyst, reactant, etc.
- 69** This subclass is indented under subclass 61. Compounds which do not include a ring.
- 70** This subclass is indented under subclass 69. Processes wherein the compound is prepared by reacting hydrogen sulfide or a hydrosulfide or a metal, e.g., reacting H<sub>2</sub>S or NaSH.
- 71** This subclass is indented under subclass 70. Processes wherein the compound is prepared by reacting hydrogen sulfide or a metal hydro-sulfide and an organic hydroxy-containing compound.
- 72** This subclass is indented under subclass 70. Processes wherein the compound is prepared by reacting hydrogen sulfide or a metal hydro-sulfide and a compound containing carbon to carbon unsaturation.
- 73** This subclass is indented under subclass 72. Processes wherein a material containing boron, phosphorus, or silicon is utilized in any way, e.g., as a catalyst, reactant, etc.
- 74** This subclass is indented under subclass 18. Compounds which contain halogen.
- 75** This subclass is indented under subclass 18. Compounds which contain oxygen.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
27, for compounds in which it is known that oxygen is bonded directly to sulfur.
- 76** This subclass is indented under subclass 75. Compounds which contain a nitro (-NO) or nitrosos (-NO) group.
- 77** This subclass is indented under subclass 18. Compounds which contain a carbocyclic ring.
- 300** This subclass is indented under subclass 1. Compounds under Class 532, ... which contain oxygen.
- (1) Note. An example of a compound provided for herein is:



## SEE OR SEARCH CLASS:

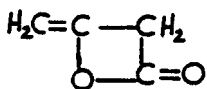
588, Hazardous or Toxic Waste Destruction or Containment, subclasses 405 through 409 for the chemical destruction of organic hazardous or toxic waste containing halogen, sulfur, oxygen, nitrogen, phosphorus, or metals.

- 301** This subclass is indented under subclass 300. Compounds which contain the following structure:

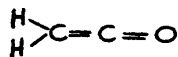


## SEE OR SEARCH CLASS:

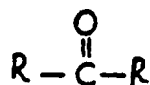
549, Organic Compounds, subclass 327 for diketenes. According to ozonolysis and X-ray analysis, diketenes have the following structure:



- 302** This subclass is indented under subclass 301. Compounds which contain the following structure:



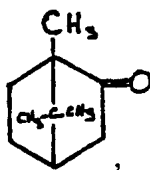
- 303** This subclass is indented under subclass 300. Compounds having the following structure wherein the R's are diverse or identical organic radicals:



- 304** This subclass is indented under subclass 303. Products wherein the ketone is mixed with a preserving or stabilizing agent which functions to prevent physical or chemical change.
- 305** This subclass is indented under subclass 303. Compounds which contain nitrogen.
- 306** This subclass is indented under subclass 305. Compounds which contain a benzene ring.
- 307** This subclass is indented under subclass 305. Compounds which do not include a ring.
- 308** This subclass is indented under subclass 303. Compounds which contain a benzene ring.
- 309** This subclass is indented under subclass 308. Processes which are directed to the preparation, purification, recovery, or treatment in any way of a benzene ring containing ketone.
- 310** This subclass is indented under subclass 309. Processes wherein the compound is prepared by transformation or rearrangement of the elements of a starting compound without adding or taking away any elements.
- 311** This subclass is indented under subclass 309. Processes wherein the compound is prepared by reacting CO or by reacting a compound which contains a -O-O- group.
- 312** This subclass is indented under subclass 309. Processes wherein the compound is prepared by reacting an aldehyde or ketone.
- 313** This subclass is indented under subclass 312. Processes wherein the compound is prepared by reacting an aldehyde with a ketone.
- 314** This subclass is indented under subclass 312. Processes wherein the compound is prepared by reacting an aldehyde or ketone and a compound containing a -COO- group, or by reacting an aldehyde or ketone which contains a -COO- group.

- 315** This subclass is indented under subclass 312. Processes wherein the compound is prepared by reacting an aldehyde or ketone and an oxy containing compound, or by reacting an oxy containing aldehyde or ketone.
- 316** This subclass is indented under subclass 312. Processes wherein the compound is prepared by reacting an aldehyde or ketone and a halogen containing compound, or by reacting a halogen containing aldehyde or ketone.
- 317** This subclass is indented under subclass 312. Processes wherein the compound is prepared by reacting an aldehyde or ketone and an unsaturated alicyclic hydrocarbon or an unsaturated acyclic hydrocarbon.
- 318** This subclass is indented under subclass 312. Processes wherein the compound is prepared by reacting an aldehyde or ketone and gaseous hydrogen or wherein the compound is prepared from an aldehyde or ketone utilizing a material containing a Group IA or IIA metal having a specific gravity less than four in any way, e.g., as a reactant, catalyst, solvent, etc.
- (1) Note. The Group IA or IIA light metal can also be a part of the aldehyde or ketone reactant.
- 319** This subclass is indented under subclass 309. Processes wherein the compound is prepared by reacting a compound containing a -COO-group, e.g., a carboxylic acid, ester, or anhydride.
- 320** This subclass is indented under subclass 309. Processes wherein the compound is prepared by oxidizing an organic compound utilizing gaseous oxygen.
- 321** This subclass is indented under subclass 320. Processes which include preparing a compound containing two or more rings.
- 322** This subclass is indented under subclass 309. Processes wherein the compound is prepared by reacting an oxy containing compound.
- 323** This subclass is indented under subclass 309. Processes wherein the compound is prepared by reacting a halogen containing compound.
- 324** This subclass is indented under subclass 309. Processes which include separating the compound from impurities or from the reaction mixture.
- 325** This subclass is indented under subclass 308. Compounds which contain at least two rings.
- 326** This subclass is indented under subclass 325. Compounds which contain a polycyclo ring system.
- 327** This subclass is indented under subclass 326. Compounds wherein the polycyclo ring system consists of two rings.
- 328** This subclass is indented under subclass 327. Compounds wherein the bicyclo ring system is the naphthyl ring system.
- 329** This subclass is indented under subclass 325. Compounds which contain at least one alicyclic ring.
- 330** This subclass is indented under subclass 329. Compounds which contain a five-membered alicyclic ring.
- 331** This subclass is indented under subclass 325. Compounds which contain a
- 332** This subclass is indented under subclass 331. Compounds wherein two benzene rings are directly bonded to the same
- 333** This subclass is indented under subclass 332. Compounds which contain oxy.
- 334** This subclass is indented under subclass 331. Compounds which contain the 1,3-diphenyl-2-propen-1 one nucleus,
- O=C(C=Cc1ccccc1)c2ccccc2
- 335** This subclass is indented under subclass 308. Compounds wherein is bonded directly to the benzene ring.

- 336** This subclass is indented under subclass 335. Compounds which contain oxy.
- 337** This subclass is indented under subclass 336. Compounds wherein the oxy is directly bonded to the benzene ring.
- 338** This subclass is indented under subclass 303. Processes which are directly to the preparation, purification, recovery, or treatment of an alicyclic ring containing ketone.
- 339** This subclass is indented under subclass 338. Processes which are directly to the preparation, purification, recovery, or treatment of camphor (see below) or a salt thereof.



- 340** This subclass is indented under subclass 339. Processes which include separating the compound from impurities or from the reaction mixture.
- 341** This subclass is indented under subclass 338. Processes wherein the compound is produced by transformation or rearrangement of the elements of a starting compound without adding or taking away any elements.
- 342** This subclass is indented under subclass 338. Processes wherein the compound is produced by reacting CO or by reacting a compound which contains a -O-O- group.
- 343** This subclass is indented under subclass 338. Processes wherein the compound is produced by reacting an aldehyde or ketone.
- 344** This subclass is indented under subclass 343. Processes wherein the compound is produced by oxidizing an aldehyde or ketone utilizing gaseous oxygen.

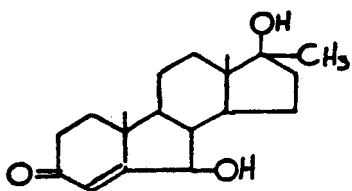
- (1) Note. Included in this subclass are processes of preparing a cycloalkanedione

by oxidizing a cycloalkanone with gaseous oxygen.

- 345** This subclass is indented under subclass 343. Processes wherein the compound is produced by reacting an aldehyde with a ketone.
- 346** This subclass is indented under subclass 343. Processes wherein the compound is produced by reacting an aldehyde or ketone with a compound containing a -COO- group, or by reacting an aldehyde or ketone which contains such a group.
- 347** This subclass is indented under subclass 343. Processes wherein the compound is prepared by reacting an aldehyde or ketone and an oxy containing compound, or by reacting an oxy containing aldehyde or ketone.
- 348** This subclass is indented under subclass 343. Processes wherein the compound is prepared by reacting an aldehyde or ketone and a halogen containing compound, or by reacting a halogen containing aldehyde or ketone.
- 349** This subclass is indented under subclass 343. Processes wherein the compound is prepared by reacting an aldehyde or ketone and an acyclic unsaturated hydrocarbon.
- 350** This subclass is indented under subclass 343. Processes wherein the compound is prepared by reacting an aldehyde or ketone and gaseous hydrogen or wherein the compound is prepared from an aldehyde or ketone utilizing a material containing a Group IA or IIA metal having a specific gravity less than four in any way, e.g., as a reactant, catalyst, solvent, etc.
- (1) Note. The Group IA or IIA light metal can also be a part of the aldehyde or ketone reactant.
- 351** This subclass is indented under subclass 343. Processes wherein the compound is prepared from an aldehyde or ketone utilizing a material containing nitrogen in any way, e.g., as a reactant, catalyst, solvent, etc.
- 352** This subclass is indented under subclass 343. Processes wherein the compound is prepared from an aldehyde or ketone utilizing a material

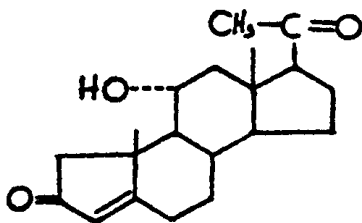
- containing boron, phosphorus, or sulfur in any way, e.g., as a reactant, catalyst, solvent, etc.
- 353** This subclass is indented under subclass 343. Processes wherein the compound is prepared by reacting two or more ketones together.
- 354** This subclass is indented under subclass 338. Processes wherein the compound is prepared by reacting a compound containing a -COO- group, e.g., a carboxylic acid, ester or anhydride.
- 355** This subclass is indented under subclass 354. Processes wherein the compound is prepared by reacting a compound containing at least two -COO- groups.
- 356** This subclass is indented under subclass 354. Processes wherein the -COO- containing reactant contains an unsaturated carbon to carbon linkage.
- 357** This subclass is indented under subclass 338. Processes wherein the compound is prepared by oxidizing an organic compound utilizing gaseous oxygen.
- 358** Processes under subclass 357 which include preparing the compound in two or more stages or zones, each including oxidation with gaseous oxygen.
- 359** This subclass is indented under subclass 357. Processes which include oxidizing an organic compound with gaseous oxygen utilizing a boron containing material in any way, e.g., as a catalyst, reactant, solvent, etc.
- 360** This subclass is indented under subclass 357. Processes which include oxidizing an organic compound with gaseous oxygen utilizing a material which contains a metal having a specific gravity greater than four in any way, e.g., as a catalyst, reactant, etc.
- 361** This subclass is indented under subclass 338. Processes wherein the compound is prepared by reacting an oxy containing compound.
- 362** This subclass is indented under subclass 361. Processes wherein the oxy containing compound is a phenol.
- 363** This subclass is indented under subclass 361. Processes which include preparing the compound by reacting an oxy containing compound and an inorganic oxygen containing compound.
- 364** This subclass is indented under subclass 338. Processes wherein the compound is prepared by reacting a halogen containing compound.
- 365** This subclass is indented under subclass 338. Processes wherein the compound is prepared by reacting an ethylenically or acetylenically unsaturated hydrocarbon.
- 366** This subclass is indented under subclass 338. Processes which include separating the compound from impurities or from the reaction mixture.
- 367** This subclass is indented under subclass 303. Compounds which contain at least two alicyclic rings.
- 368** This subclass is indented under subclass 367. Compounds which contain a polycyclo ring system.
- 369** This subclass is indented under subclass 368. Compounds wherein the polycyclo ring system consists of four rings.
- 370** This subclass is indented under subclass 369. Compounds wherein the tetracyclo ring system consists of two five-membered cyclos and two six-membered cyclos.
- (1) Note. Examples of compounds provided for herein are:





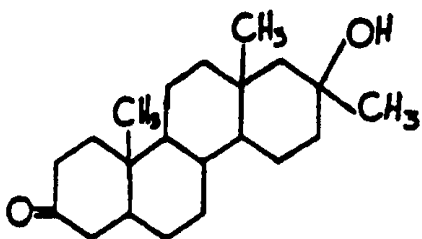
- 371** This subclass is indented under subclass 370. Compounds wherein the two six-membered rings of the tetracyclo ring system are fused to each other.

(1) Note. An example of a compound provided for herein is:



- 372** This subclass is indented under subclass 369. Compounds wherein the tetracyclo ring system consists of four six-membered rings.

(1) Note. An example of a compound provided for herein is:



**373** This subclass is indented under subclass 368. Compounds wherein the polycyclo ring system consists of three rings.

**374** This subclass is indented under subclass 368. Compounds wherein the polycyclo ring system consists of two rings.

**375** This subclass is indented under subclass 303. Compounds which contain an alicyclic ring having seven or more ring carbons.

**376** This subclass is indented under subclass 303. Compounds which include a six-membered alicyclic ring.

**377** This subclass is indented under subclass 376. Compounds wherein the ring is partially unsaturated.

**378** This subclass is indented under subclass 377. Compounds which contain a 2,6,6-trialkylcyclohexenyl nucleus.

**379** This subclass is indented under subclass 303. Compounds which include a five-membered alicyclic ring.

**380** This subclass is indented under subclass 379. Compounds which contain halogen.

**381** This subclass is indented under subclass 303. Compounds which include a four-membered alicyclic ring.

**382** This subclass is indented under subclass 303. Compounds which do not include a ring.

**383** This subclass is indented under subclass 382. Processes which are directed to the preparation, purification, recovery, or treatment in any way of an acyclic ketone.

**384** This subclass is indented under subclass 383. Processes wherein the compound is prepared by transformation or rearrangement of the elements of a starting compound without adding or taking away any elements.

**385** This subclass is indented under subclass 383. Processes wherein the compound is prepared by reacting a compound which contains a -O-O- group.

- 386** This subclass is indented under subclass 383. Processes wherein the compound is prepared by reacting a compound which contains a ring.
- 387** This subclass is indented under subclass 383. Processes wherein the compound is prepared by reacting CO.
- 388** This subclass is indented under subclass 383. Processes wherein the compound is prepared by reacting an aldehyde or ketone.
- 389** This subclass is indented under subclass 388. Processes wherein the compound is prepared by oxidizing an aldehyde or ketone, or another organic compound in conjunction with an aldehyde or ketone, utilizing gaseous oxygen as the oxidizing agent.
- 390** This subclass is indented under subclass 388. Processes wherein the compound is prepared by reacting an aldehyde with a ketone.
- 391** This subclass is indented under subclass 388. Processes wherein the compound is prepared by reacting an aldehyde or ketone and an oxy containing compound, or by reacting an oxy containing aldehyde or ketone.
- 392** This subclass is indented under subclass 391. Processes wherein the compound is prepared by reacting an oxy containing aldehyde or ketone.
- 393** This subclass is indented under subclass 388. Processes wherein the compound is prepared by reacting an aldehyde or ketone and a halogen containing compound, or by reacting a halogen containing aldehyde or ketone.
- 394** This subclass is indented under subclass 393. Processes wherein the compound is prepared by reacting a halogen containing aldehyde or ketone.
- 395** This subclass is indented under subclass 388. Processes wherein the compound is prepared by reacting an aldehyde or ketone and an unsaturated acyclic hydrocarbon.
- 396** This subclass is indented under subclass 388. Processes wherein the compound is prepared by reacting an aldehyde or ketone and gaseous hydrogen, or wherein the compound is prepared from an aldehyde or ketone utilizing a material containing a Group IA or IIA metal having a specific gravity less than four in any way, e.g., as a reactant, catalyst, solvent, etc.
- (1) Note. The Group IA or IIA metal can also be a part of the aldehyde or ketone reactant.
- 397** This subclass is indented under subclass 383. Processes wherein the compound is prepared by reacting a compound containing a -COO- group, e.g., a carboxylic acid, ester, or anhydride.
- 398** This subclass is indented under subclass 397. Processes wherein the -COO- containing reactant contains an unsaturated carbon to carbon linkage.
- 398.8 Oxidation of hydrocarbon mixtures:** This subclass is indented under subclass 383. Processes wherein the compound is prepared by oxidizing a mixture of hydrocarbons.
- 399** This subclass is indented under subclass 383. Processes wherein the compound is prepared by oxidizing an organic compound utilizing gaseous oxygen.
- 400** This subclass is indented under subclass 399. Processes which include an acyclic unsaturated hydrocarbon as a reactant.
- 401** This subclass is indented under subclass 400. Processes which include utilizing a material containing silver, gold, palladium, platinum, rhodium, iridium, ruthenium, or osmium as a catalyst.
- 402** This subclass is indented under subclass 399. Processes wherein the compound is prepared by oxidizing a hydroxy containing reactant with gaseous oxygen.
- 403** This subclass is indented under subclass 383. Processes wherein the compound is prepared by reacting an oxy containing compound.
- 404** This subclass is indented under subclass 403. Processes wherein the compound is prepared by reacting an oxy containing compound utilizing a material containing phosphorus, sulfur, or

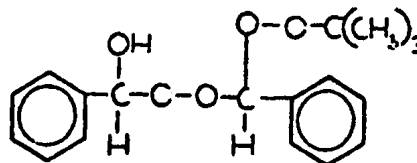
- halogen in any way, e.g., as a reactant, catalyst, solvent, etc.
- 405** This subclass is indented under subclass 403. Processes wherein the compound is prepared by utilizing an ether or a polyhydroxy containing compound in any way, e.g., as a reactant, solvent, etc.
- 406** This subclass is indented under subclass 403. Processes wherein the compound is prepared by reacting an oxy containing compound utilizing an aluminum or silicon containing a material in any way, e.g., as reactant, catalyst, solvent, etc.
- 407** This subclass is indented under subclass 383. Processes wherein the compound is prepared by reacting a halogen containing compound.
- 408** This subclass is indented under subclass 383. Processes wherein the compound is prepared by reacting a compound containing an unsaturated carbon to carbon linkage.
- 409** This subclass is indented under subclass 408. Processes wherein the carbon to carbon unsaturation is acetylenic.
- 410** This subclass is indented under subclass 383. Processes which include separating the compound from impurities or from the reaction mixture.
- 411** This subclass is indented under subclass 410. Processes wherein the compound purified or recovered has the following structure in which one or more hydrogens may be replaced by halogens:
- 412** This subclass is indented under subclass 382. Compounds which contain at least two groups.
- 413** This subclass is indented under subclass 412. Compounds which contain an oxy group.
- 414** This subclass is indented under subclass 382. Compounds which contain an oxy or a peroxy group, i.e., -O- or -O-O- containing.
- 415** This subclass is indented under subclass 414. Compounds which contain an unsaturated carbon to carbon linkage.
- 416** This subclass is indented under subclass 414. Compounds which contain halogen.
- 417** This subclass is indented under subclass 382. Compounds which contain an unsaturated carbon to carbon linkage.
- 418** This subclass is indented under subclass 417. Compounds which contain halogen.
- 419** This subclass is indented under subclass 382. Compounds which contain halogen.
- 420** This subclass is indented under subclass 300. Compounds having the following structure wherein R is H or an organic radical:
- 421** This subclass is indented under subclass 420. Products wherein the aldehyde is mixed with a preserving or stabilizing agent which functions to prevent physical or chemical change.
- 422** This subclass is indented under subclass 421. Products which contain, as illustrated below, (formaldehyde) in admixture with a preserving or stabilizing agent.
- 423** This subclass is indented under subclass 420. Compounds which contain nitrogen.
- 424** This subclass is indented under subclass 423. Compounds which contain a benzene ring.
- 425** This subclass is indented under subclass 420. Compounds which contain a benzene ring.
- 426** This subclass is indented under subclass 425. Processes which are directed to the preparation, recovery, or treatment in any way of a benzene ring containing aldehyde.
- 427** This subclass is indented under subclass 426. Processes wherein the compound is prepared by transformation or rearrangement of the elements of a starting compound without adding or taking away any elements.
- 428** This subclass is indented under subclass 426. Processes wherein the compound is prepared by reacting CO.

- 429** This subclass is indented under subclass 428. Processes wherein the compound is prepared by reacting an ethylenically unsaturated compound, carbon monoxide, and gaseous hydrogen, only.
- 430** This subclass is indented under subclass 426. Processes wherein the compound is prepared by reacting ozone, O<sub>3</sub>, or by reacting a compound which contains a -O-O- group.
- 431** This subclass is indented under subclass 426. Processes wherein the compound is prepared by oxidizing an organic compound utilizing gaseous oxygen as the oxidizing agent.
- 432** This subclass is indented under subclass 431. Processes wherein an aldehyde which contains oxy is prepared.
- 433** This subclass is indented under subclass 426. Processes wherein the compound is prepared by reacting an aldehyde.
- 434** This subclass is indented under subclass 433. Processes wherein the compound is prepared by reacting an aldehyde and gaseous hydrogen.
- 435** This subclass is indented under subclass 426. Processes wherein the compound is prepared by reacting a compound containing -COO- group, e.g., a carboxylic acid, ester, or anhydride.
- 436** This subclass is indented under subclass 426. Processes wherein the compound is prepared by utilizing a material containing nitrogen in any way, e.g., as reactant, catalyst, solvent, etc.
- 437** This subclass is indented under subclass 426. Processes wherein the compound is prepared by reacting a compound containing halogen.
- 438** This subclass is indented under subclass 426. Processes which include separating the compound from impurities or from the reaction mixture.
- 439** This subclass is indented under subclass 425. Compounds which contain a polycyclo ring system.
- 440** This subclass is indented under subclass 439. Compounds wherein the polycyclo ring system consists of two rings.
- 441** This subclass is indented under subclass 440. Compounds which contain oxy.
- 442** This subclass is indented under subclass 425. Compounds which contain oxy.
- 443** This subclass is indented under subclass 420. Processes wherein an aldehyde containing an alicyclic ring is prepared by transformation or rearrangement of the elements of a starting compound without adding or taking away any elements.
- 444** This subclass is indented under subclass 420. Processes wherein an aldehyde containing an alicyclic ring is prepared by utilizing only the following three reactants: an ethylenically unsaturated compound, carbon monoxide, and gaseous hydrogen.
- 445** This subclass is indented under subclass 420. Compounds which contain an alicyclic polycyclo ring system.
- 446** This subclass is indented under subclass 420. Compounds which contain an unsaturated alicyclic ring.
- 447** This subclass is indented under subclass 446. Compounds which contain a 2,6,6-trialkylcyclohexenyl nucleus.
- 448** This subclass is indented under subclass 420. Compounds which do not include a ring.
- 449** This subclass is indented under subclass 448. Processes which are directed to the preparation, purification, recovery, or treatment in any way of an acyclic aldehyde.
- 450** This subclass is indented under subclass 449. Processes wherein the compound is prepared by transformation or rearrangement of the elements of a starting compound without adding or taking away any elements.
- 451** This subclass is indented under subclass 449. Processes wherein the compound is prepared by reacting an ethylenically unsaturated com-

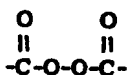
- pound, carbon monoxide, and gaseous hydrogen, only.
- 452** This subclass is indented under subclass 451. Processes wherein an aldehyde is produced which has at least twice as many carbon atoms as the ethylenically unsaturated compound reactant.
- 453** This subclass is indented under subclass 451. Processes wherein the compound is produced in two or more stages or zones, each consisting of reacting an ethylenically unsaturated compound, carbon monoxide, and gaseous hydrogen.
- 454** This subclass is indented under subclass 451. Processes wherein a material containing nitrogen, phosphorus, arsenic, antimony, or bismuth is utilized in the hydroformylation reaction in any way, e.g., as a catalyst, solvent, etc.
- 455** This subclass is indented under subclass 454. Processes wherein a nitrogen containing material is utilized in any way, e.g., as a catalyst, solvent, etc.
- 456** This subclass is indented under subclass 451. Processes wherein a metal containing compound is filtered, precipitated, or deposited in the hydroformylation process.
- 457** This subclass is indented under subclass 449. Processes wherein the compound is prepared by reacting a polymer of formaldehyde, e.g., decomposing paraformaldehyde to monomeric formaldehyde by heat.
- 458** This subclass is indented under subclass 449. Processes wherein the compound is prepared by reacting an aldehyde.
- 459** This subclass is indented under subclass 458. Processes wherein an aldehyde containing an unsaturated carbon to carbon linkage is prepared, e.g., acetylenic or ethylenic unsaturation containing.
- 460** This subclass is indented under subclass 459. Processes wherein an aldehyde containing carbon to carbon unsaturation is prepared by reacting an aldehyde and a compound containing an oxy or -COO- group, or by reacting an oxy or -COO- containing aldehyde.
- 461** This subclass is indented under subclass 459. Processes wherein an aldehyde containing carbon to carbon unsaturation is prepared by reacting two or more aldehydes.
- 462** This subclass is indented under subclass 458. Processes wherein the compound is prepared by reacting an aldehyde and gaseous hydrogen.
- 463** This subclass is indented under subclass 458. Processes wherein the compound is prepared by reacting two or more aldehydes.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
 461, for processes of preparing an acetylenically or ethylenically unsaturated aldehyde by reacting two or more aldehydes.
- 464** This subclass is indented under subclass 463. Processes wherein the compound is prepared by reacting two or more different aldehydes.
- 465** This subclass is indented under subclass 458. Processes wherein the compound is prepared by reacting a compound containing oxy or a -COO- group, or by reacting an oxy or -COO- containing aldehyde.
- 466** This subclass is indented under subclass 458. Processes wherein the compound is prepared by reacting an aldehyde with hydrogen halide or elemental halogen.
- 467** This subclass is indented under subclass 449. Processes wherein the compound is prepared by reacting acetylene,  $HC = CH$
- 468** This subclass is indented under subclass 467. Processes wherein a catalyst containing mercury is utilized.
- 469** This subclass is indented under subclass 449. Processes which include ozone,  $O_3$ , as a reactant.
- 469.9** **Oxidation of hydrocarbon mixtures:**  
 This subclass is indented under subclass 449. Processes wherein the compound is prepared by oxidizing a mixture of hydrocarbons.

- 470** This subclass is indented under subclass 449. Processes wherein the compound is prepared by oxidizing an organic compound utilizing gaseous oxygen as an oxidizing agent.
- 471** This subclass is indented under subclass 470. Processes which include reacting an organic -OH containing compound.
- 472** This subclass is indented under subclass 471. Processes wherein the organic -OH containing compound is methanol.
- 473** This subclass is indented under subclass 472. Processes wherein a catalyst containing silver is utilized.
- 474** This subclass is indented under subclass 472. Processes wherein a catalyst containing molybdenum is utilized.
- 475** This subclass is indented under subclass 470. Processes which include reacting an acyclic hydrocarbon.
- 476** This subclass is indented under subclass 475. Processes wherein an aldehyde containing carbon to carbon unsaturation is prepared in an oxidation reaction utilizing a reactant containing carbon to carbon unsaturation.
- 477** This subclass is indented under subclass 476. Processes wherein a catalyst containing antimony or tin is utilized.
- 478** This subclass is indented under subclass 476. Processes wherein a catalyst containing silver, gold, palladium, platinum, rhodium, iridium, ruthenium, or osmium is utilized.
- 479** This subclass is indented under subclass 476. Processes wherein a catalyst containing molybdenum is utilized.
- 480** This subclass is indented under subclass 479. Processes wherein a catalyst containing molybdenum and phosphorus is utilized.
- 481** This subclass is indented under subclass 476. Processes wherein the compound is prepared by utilizing a material containing selenium or tellurium in any way, e.g., as a reactant, catalyst, solvent, etc.
- 482** This subclass is indented under subclass 475. Processes wherein the acyclic hydrocarbon reactant is methane.
- 483** This subclass is indented under subclass 449. Processes wherein the compound is prepared by reacting a heterocyclic compound.
- 484** This subclass is indented under subclass 449. Processes wherein the compound is prepared by reacting a compound containing a -COO-group, e.g., a carboxylic acid, ester, or anhydride.
- 485** This subclass is indented under subclass 449. Processes wherein the compound is prepared by reacting an oxy-containing compound or by reacting a compound which contains a -O-O-group.
- 486** This subclass is indented under subclass 485. Processes wherein the compound is prepared by reacting a compound containing two or more oxy.
- 487** This subclass is indented under subclass 485. Processes wherein the compound is prepared by reacting methanol or ethanol.
- 488** This subclass is indented under subclass 485. Processes wherein the compound is prepared by reacting an oxy or peroxy containing compound with a halogen containing compound, or by reacting a compound which contains halogen and oxy or peroxy.
- 489** This subclass is indented under subclass 485. Processes wherein the compound is prepared by reacting an oxy or peroxy containing compound utilizing a material containing silver, gold, palladium, platinum, rhodium, iridium, ruthenium, or osmium in any way, e.g., as a reactant, catalyst, solvent, etc.
- 490** This subclass is indented under subclass 449. Processes wherein the compound is prepared by reacting a halogen containing compound.
- 491** This subclass is indented under subclass 449. Processes wherein water is utilized as a reactant in preparing the compound.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
467, for processes of preparing an acyclic aldehyde by reacting acetylene and water.
- 492** This subclass is indented under subclass 449. Processes wherein the compound is separated from impurities or from the reaction mixture.
- 493** This subclass is indented under subclass 492. Processes of purifying or
- 494** This subclass is indented under subclass 448. Compounds which contain
- 495** This subclass is indented under subclass 448. Compounds which contain halogen.
- 496** This subclass is indented under subclass 448. Compounds which contain oxy.
- 497** This subclass is indented under subclass 496. Compounds which contain at least two oxy.
- 557 Oxonium (e.g., beryllium hydride etherate, etc.):**  
This subclass is indented under subclass 300. Compounds which are addition or double compounds of an organic oxide, i.e., an ether, and an inorganic acid or salt thereof.
- (1) Note. This subclass contains, for example, the HCL addition compound of dimethyl ether.
- 558 Peroxy bonded directly to carbon:**  
This subclass is indented under subclass 300. Compounds which contain an -O-O- group bonded directly to carbon.
- (1) Note. This subclass contains, for example, the HCL addition compound of dimethyl ether.
- 559 With preservative or stabilizer:**  
This subclass is indented under subclass 558. Products which contain the peroxy containing compound in admixture with an agent which functions to prevent physical or chemical change.
- 560 Halogen containing:**  
This subclass is indented under subclass 558. Compounds which contain halogen.
- 561 Plural peroxy groups:**  
This subclass is indented under subclass 558. Compounds which contain more than one peroxy group.
- 562 Purification or recovery:**  
This subclass is indented under subclass 561. Processes which include separating the compound from impurities or from the reaction mixture.
- 563 Additional oxygen containing:**  
This subclass is indented under subclass 561. Compounds which contain nonperoxy oxygen.
- (1) Note. This subclass contains, for example:

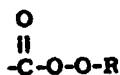


- 564 Hydroperoxy containing:**  
This subclass is indented under subclass 561. Compounds which contain at least one H-O-O-group.
- 565 Preparing by oxidation utilizing gaseous oxygen:**  
This subclass is indented under subclass 564. Processes which include preparing the compound by oxidation utilizing molecular oxygen or an oxygen containing gas as an oxidizing agent.
- 566 Plural carbonyl groups bonded directly to the peroxy group (e.g., acetyl peroxide, etc.):**  
This subclass is indented under subclass 558. Compounds which contain the group below.

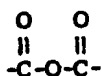


SEE OR SEARCH CLASS:

560, Organic Compounds, subclass 302 for peroxy esters (see below) where R is not carbonyl; and subclass 545 for acid anhydrides.



562, Organic Compounds, subclass 887 for acid anhydrides (see below).



**567 Oxy containing:**

This subclass is indented under subclass 558. Compounds which contain an oxy group.

**568 Hydroperoxy containing:**

This subclass is indented under subclass 558. Compounds which contain a H-O-O- group.

**569 Preparing by oxidation utilizing gaseous oxygen:**

This subclass is indented under subclass 568. Processes which include preparing the compound by oxidation utilizing molecular oxygen or an oxygen containing gas as an oxidizing agent.

**570 Alicyclic hydroperoxide produced:**

This subclass is indented under subclass 569. Processes wherein a compound containing at least one alicyclic ring is produced.

**571 Acyclic hydroperoxide produced:**

This subclass is indented under subclass 569. Processes wherein a compound having no rings in its structure is produced.

**572 Pretreatment of material oxidized:**

This subclass is indented under subclass 569. Processes wherein, prior to oxidation, the material to be oxidized is subjected to a physical or chemical treatment to condition it for oxidation.

**573 Initiator, accelerator, or catalyst utilized:**

This subclass is indented under subclass 569. Processes wherein the oxidation is carried out in the presence of an initiator, accelerator, or catalyst which acts to regulate the reaction by reducing the induction period or by increasing or by decreasing the rate of the reaction.

**574 Metal containing:**

This subclass is indented under subclass 573. Processes wherein the initiator, accelerator, or catalyst contains a metal.

**575 Heavy metal:**

This subclass is indented under subclass 574. Processes wherein the metal utilized has a specific gravity greater than four.

**576 Purification or recovery:**

This subclass is indented under subclass 568. Processes which include separating the compound from impurities or from the reaction mixture.

**577 Preparing by oxidation utilizing gaseous oxygen:**

This subclass is indented under subclass 558. Processes which include preparing the compound by oxidation utilizing molecular oxygen or an oxygen containing gas as an oxidizing agent.

**578 Preparing by reacting an organic hydroperoxide and an organic hydroxy containing compound (H of -OH may be substituted by M):**

This subclass is indented under subclass 558. Processes which include preparing the compound by reacting an organic hydroperoxide and an organic hydroxy containing compound.

**579 Ether containing:**

This subclass is indented under subclass 300. Compounds which contain an oxygen bonded to two carbons of discrete organic radicals and having the type formula R-O-R.



SEE OR SEARCH THIS CLASS, SUB-CLASS:  
38, for thioethers.

**580 With preservative or stabilizer:**

This subclass is indented under subclass 579. Products which contain the ether containing compound in admixture with an agent which functions to prevent physical or chemical change.

**581 Acyclic ether preserved:**

This subclass is indented under subclass 580. Products wherein the compound preserved does not include a ring.

**582 Nitrogen containing preservative:**

This subclass is indented under subclass 581. Products wherein the preserving or stabilizing agent contains nitrogen.

**583 Nitrogen containing:**

This subclass is indented under subclass 579. Compounds which contain nitrogen.

**584 Aromatic having ether oxygen bonded directly to a benzene ring:**

This subclass is indented under subclass 583. Compounds which contain at least one benzene ring having an ether oxygen bonded directly thereto.

**585 Plural rings containing:**

This subclass is indented under subclass 584. Compounds which contain at least two rings.

**586 Polyoxy:**

This subclass is indented under subclass 585. Compounds which contain two or more oxy groups.

**587 Polyoxy:**

This subclass is indented under subclass 584. Compounds which contain two or more oxy groups.

**588 Halogen containing:**

This subclass is indented under subclass 584. Compounds which contain halogen.

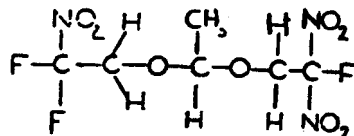
**589 Acyclic:**

This subclass is indented under subclass 583. Compounds which do not include a ring.

**590 Plural oxygens bonded directly to the same carbon (e.g., acetals, ketals, orthoesters, orthocarbonates, etc.):**

This subclass is indented under subclass 589. Compounds wherein two or more oxygens are bonded to a single carbon.

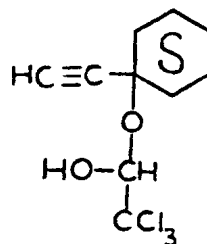
(1) Note. An example of a compound provided for herein is:



**591 Plural oxygens bonded directly to the same carbon (e.g., acetals, ketals, orthoesters, orthocarbonates, etc.):**

This subclass is indented under subclass 579. Compounds wherein two or more oxygens are bonded to a single carbon.

(1) Note. An example of a compound provided for herein is:



SEE OR SEARCH THIS CLASS, SUB-CLASS:

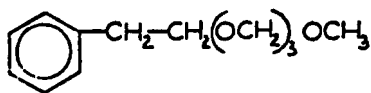
420+, for aldehyde hydrates.

**592 Aromatic:**

This subclass is indented under subclass 591. Compounds which contain a benzene ring.

**593 Plural oxyalkylene groups bonded directly to each other:**

This subclass is indented under subclass 592. Compounds which contain two or more successive oxyalkylene groups. (1) Note. An example of a compound provided for herein is:

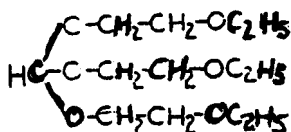
**594 Acyclic:**

This subclass is indented under subclass 591. Compounds which do not include a ring.

**595 At Least three oxygens bonded directly to the same carbon (e.g., orthoesters, etc.):**

This subclass is indented under subclass 594. Compounds wherein three or more oxygens are bonded to a single carbon.

- (1) Note. An example of a compound provided for herein is:

**596 Unsaturated:**

This subclass is indented under subclass 594. Compounds which are acetylenically or ethylenically unsaturated.

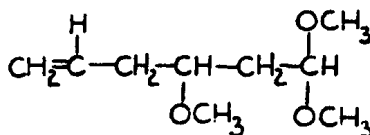
**597 Acetylenic unsaturation:**

This subclass is indented under subclass 596. Compounds which are acetylenically unsaturated.

**598 At Least three oxygens containing:**

This subclass is indented under subclass 596. Compounds which contain three or more oxygens.

- (1) Note. An example of a compound provided for herein is:

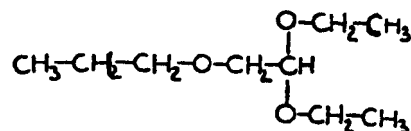
**599 One of the plural oxygens is in a hydroxy group (i.e., hemiacetals and hemiketals):**

This subclass is indented under subclass 594. Compounds wherein one of the oxygens bonded to the same carbon is the oxygen of a hydroxy group.

**600 At Least three oxygens containing:**

This subclass is indented under subclass 594. Compounds which contain three or more oxygens.

- (1) Note. An example of a compound provided for herein is:

**601 Plural oxyalkylene groups bonded directly to each other:**

This subclass is indented under subclass 600. Compounds which contain two or more successive oxyalkylene groups.

**602 Hydroxy bonded directly to each end of a chain which is polyoxymethylene only (e.g., paraformaldehyde, etc.):**

This subclass is indented under subclass 601. Compounds which contain two or more successive oxymethylene groups having hydroxy groups bonded directly to each end.

- (1) Note. Included in this subclass are the polymers of formaldehyde known as paraformaldehyde.

**SEE OR SEARCH CLASS:**

- 528, Synthetic Resins, subclasses 230+ for synthetic resins made by polymerizing aldehydes.  
549, Organic Compounds, subclass 353 and 367+ for polyhetero-oxygen heterocyclic carbon compounds resulting from the polymerization of aldehydes only.

**603 Plural acetal or ketal groups (e.g., tetraacetals, etc.):**

This subclass is indented under subclass 600. Compounds which contain two or more carbons having two or more oxygens bonded directly thereto.

**604 Halogen containing:**

This subclass is indented under subclass 594. Compounds which contain halogen.

**605 Ion Exchange resin or sulfuric acid utilized:**

This subclass is indented under subclass 594. Processes wherein an ion exchange resin or sulfuric acid is utilized in preparing the compound.

**606 Plural oxyalkylene groups bonded directly to each other:**

This subclass is indented under subclass 579. Compounds which contain two or more successive oxyalkylene groups.

**607 Aromatic:**

This subclass is indented under subclass 606. Compounds which contain a benzene ring.

**608 Ether oxygen bonded directly to a benzene ring:**

This subclass is indented under subclass 607. Compounds wherein an ether oxygen is bonded directly to a carbon of at least one benzene ring.

**609 Plural rings containing:**

This subclass is indented under subclass 608. Compounds which contain at least two rings.

**610 Halogen containing:**

This subclass is indented under subclass 608. Compounds which contain halogen.

**611 Plural rings containing:**

This subclass is indented under subclass 607. Compounds which contain at least two rings.

**612 Polycyclo alicyclic ring system:**

This subclass is indented under subclass 606. Compounds which contain a polycyclo alicyclic ring system.

**613 Acyclic:**

This subclass is indented under subclass 606. Compounds which do not include a ring.

**614 Halogen containing:**

This subclass is indented under subclass 613. Compounds which contain halogen.

**615 Fluorine:**

This subclass is indented under subclass 614. Compounds which contain fluorine.

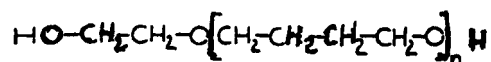
**616 Unsaturated:**

This subclass is indented under subclass 613. Compounds which are acetylenically or ethylenically unsaturated.

**617 Polytetramethylene glycols:**

This subclass is indented under subclass 613. Compounds which contain two or more oxytetramethylene moieties terminated by hydroxy groups.

(1) Note. An example of a compound provided for herein is:

**618 Preparing from organic hydroxy containing compound (H of -OH may be substituted by M):**

This subclass is indented under subclass 613. Processes which include preparing the compound by reacting an organic hydroxy containing compound.

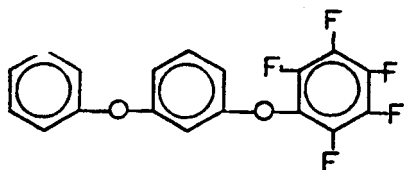
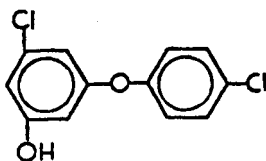
**619 From polyhydroxy containing compound:**

This subclass is indented under subclass 618. Processes wherein the organic hydroxy containing compound contains two or more hydroxy groups.

**620 And cyclic ether:**

This subclass is indented under subclass 619. Processes which include preparing the compound by reacting an organic polyhydroxy containing compound and a cyclic ether.

- 621 Purification or recovery:**  
This subclass is indented under subclass 613. Processes which include separating the compound from impurities or from the reaction mixture.
- 622 Hydroxy containing (H of -OH may be substituted by M):**  
This subclass is indented under subclass 613. Compounds which include a hydroxy group.
- 623 Polyhydroxy containing:**  
This subclass is indented under subclass 622. Compounds which include two or more hydroxy groups.
- 624 Plural diverse oxyalkylene groups containing:**  
This subclass is indented under subclass 623. Compounds which include two or more different oxyalkylene groups.
- 625 Plural diverse oxyalkylene groups containing:**  
This subclass is indented under subclass 622. Compounds which include two or more different oxyalkylene groups.
- 626 Aromatic:**  
This subclass is indented under subclass 579. Compounds which contain a benzene ring.
- 627 Preparing by isomerization:**  
This subclass is indented under subclass 626. Processes wherein the compound is produced by transformation or rearrangement of the elements of a starting compound without adding or taking away any elements.
- 628 Preparing by alkylation of benzene ring:**  
This subclass is indented under subclass 626. Processes wherein the compound is formed in a reaction which adds an alkyl group to a benzene ring.
- 629 Preparing by hydroxylation of benzene ring:**  
This subclass is indented under subclass 626. Processes which include preparing the compound by oxidizing an aromatic starting material in the presence of water whereby one or more hydroxy groups are added to a benzene ring.
- 630 Ether oxygen bonded directly to a benzene ring:**  
This subclass is indented under subclass 626. Compounds wherein an ether oxygen is bonded directly to a carbon of at least one benzene ring.
- 631 Plural rings containing:**  
This subclass is indented under subclass 630. Compounds which contain at least two rings.
- 632 Polycyclo ring system:**  
This subclass is indented under subclass 631. Compounds which contain a polycyclo ring system.
- 633 Polyoxy:**  
This subclass is indented under subclass 632. Compounds which contain two or more oxy groups.
- 634 Halogen containing:**  
This subclass is indented under subclass 632. Compounds which contain halogen.
- 635 Plural benzene rings bonded directly to the same oxygen:**  
This subclass is indented under subclass 631. Compounds which contain at least two benzene rings bonded directly to the same oxygen.
- 636 Polyoxy:**  
This subclass is indented under subclass 635. Compounds which contain two or more oxy groups.
- 637 Halogen containing:**  
This subclass is indented under subclass 636. Compounds which contain halogen.
- (1) Note. Examples of compounds provided for herein are:



**638 Hydroxy containing (H of -OH May be substituted by M):**

This subclass is indented under subclass 636. Compounds which contain a hydroxy group.

**639 Halogen containing:**

This subclass is indented under subclass 635. Compounds which contain halogen.

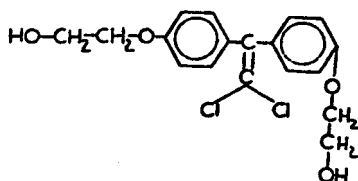
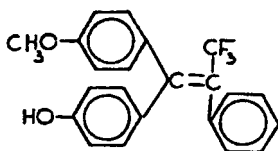
**640 Plural benzene rings bonded directly to the same carbon:**

This subclass is indented under subclass 631. Compounds wherein two or more benzene rings are bonded directly to the same carbon.

**641 Polyoxy and halogen containing:**

This subclass is indented under subclass 640. Compounds which contain two or more oxy groups and halogen.

(1) Note. Examples of compounds provided for herein are:



**642 Plural benzene rings bonded directly to each other:**

This subclass is indented under subclass 631. Compounds which contain at least two benzene rings bonded directly to each other.

**643 Polyoxy:**

This subclass is indented under subclass 642. Compounds which contain two or more oxy groups.

**644 Polyoxy:**

This subclass is indented under subclass 631. Compounds which contain two or more oxy groups.

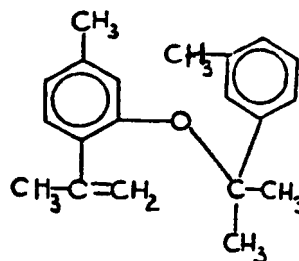
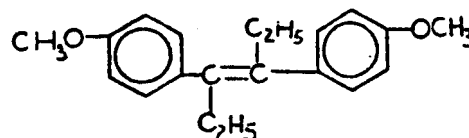
**645 Halogen containing:**

This subclass is indented under subclass 644. Compounds which contain halogen.

**646 Acyclic unsaturation containing:**

This subclass is indented under subclass 644. Compounds which contain acetylenic or ethylenic unsaturation in a side or connecting chain.

(1) Note. Examples of compounds provided for herein are:

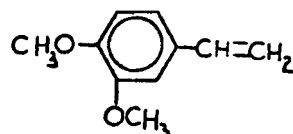


**647 Halogen containing:**

This subclass is indented under subclass 631. Compounds which contain halogen.

**648 Polyoxy:**

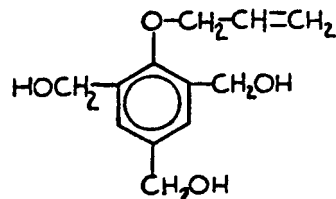
This subclass is indented under subclass 630. Compounds which contain two or more oxy groups.

**649 Halogen containing:**

This subclass is indented under subclass 648. Compounds which contain halogen.

**650 Hydroxy bonded directly to the benzene ring (H of -OH may be substituted by M):**

This subclass is indented under subclass 648. Compounds which contain a hydroxy group bonded directly to the benzene ring.

**651 Plural ether oxygens bonded directly to the benzene ring:**

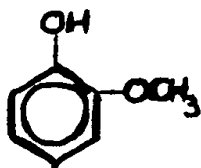
This subclass is indented under subclass 650. Compounds wherein two or more ether oxygens are bonded directly to the benzene ring.

**652 Ether oxygen is ortho to the hydroxy:**

This subclass is indented under subclass 650. Compounds wherein an ether oxygen is ortho to a hydroxy group on the benzene ring.

**653 Guaiacol per se or salt thereof:**

This subclass is indented under subclass 652. The definite compound of the structure below, wherein the H of the -OH may be replaced by a substituted or unsubstituted ammonium ion or a Group IA or IIA light metal.:

**654 Acyclic unsaturation containing:**

This subclass is indented under subclass 648. Compounds which contain an acetylenically or ethylenically unsaturated side chain.

(1) Note. Examples provided for herein are:

**655 Halogen containing:**

This subclass is indented under subclass 630. Compounds which contain halogen.

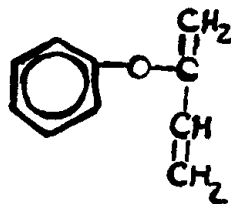
**656 Halogen bonded directly to the benzene ring:**

This subclass is indented under subclass 655. Compounds wherein the halogen is bonded directly to the benzene ring.

**657 Aryl-oxy-alkenyl or aryl-oxy-alkynyl:**

This subclass is indented under subclass 630. Compounds wherein the etherifying group is ethylenically or acetylenically unsaturated.

(1) Note. An example of a compound provided for herein is:

**658 Acyclic hydrocarbonyl group bonded directly to the benzene ring:**

This subclass is indented under subclass 630. Compounds which contain an acyclic substituent of hydrogen and carbon.

**659 Plural rings containing:**

This subclass is indented under subclass 626. Compounds which contain at least two rings.

- 660 Polyoxy:**  
This subclass is indented under subclass 659. Compounds which contain two or more oxy groups.
- 661 Halogen containing:**  
This subclass is indented under subclass 659. Compounds which contain halogen.
- 662 Polyoxy:**  
This subclass is indented under subclass 626. Compounds which contain two or more oxy groups.
- 663 Halogen containing:**  
This subclass is indented under subclass 626. Compounds which contain halogen.
- 664 Plural alicyclic rings containing:**  
This subclass is indented under subclass 579. Compounds which contain at least two alicyclic rings.
- 665 Polycyclo ring system:**  
This subclass is indented under subclass 664. Compounds which contain a polycyclo ring system.
- 666 Alicyclic terpenic wherein the number of carbons is a multiple of five:**  
This subclass is indented under subclass 579. Compounds having an alicyclic ring derived from terpenes wherein the number of carbon atoms is a multiple of five.
- 667 Unsaturated alicyclic ring containing:**  
This subclass is indented under subclass 579. Compounds containing an unsaturated alicyclic ring.
- 668 2,6,6-trialkylcyclohexenyl (e.g., vitamin a derivatives, etc.):**  
This subclass is indented under subclass 667. Compounds which contain a 2,6,6-trialkylcyclohexenyl nucleus.
- 669 Alicyclic ring and halogen containing:**  
This subclass is indented under subclass 579. Compounds which contain an alicyclic ring and halogen.
- 670 Alicyclic ring and polyoxy containing:**  
This subclass is indented under subclass 579. Compounds which contain an alicyclic ring and two or more oxy groups.
- 671 Acyclic:**  
This subclass is indented under subclass 579. Compounds which do not include a ring.
- 672 Polyoxy:**  
This subclass is indented under subclass 671. Compounds which contain two or more oxy groups.
- (1) Note. Included in this subclass are metal complexed ethers, e.g.,  $\text{Mg}(\text{OCH}_3)_2 \cdot 3\text{CH}_3\text{OH}$ .
- 673 Unsaturated:**  
This subclass is indented under subclass 672. Compounds which are acetylenically or ethylenically unsaturated.
- 674 Halogen containing:**  
This subclass is indented under subclass 673. Compounds which contain halogen.
- 675 Hydroxy containing (H of -OH may be substituted by M):**  
Compounds under subclass 673 which contain a hydroxy group.
- 676 Halogen containing:**  
This subclass is indented under subclass 672. Compounds which contain halogen.
- 677 Fluorine:**  
This subclass is indented under subclass 676. Compounds which contain fluorine.
- 678 Hydroxy containing (H of -OH may be substituted by M):**  
This subclass is indented under subclass 672. Compounds which contain a hydroxy group.
- 679 Polyether:**  
This subclass is indented under subclass 678. Compounds which contain two or more ether groups.

- 680 Polyhydroxy:**  
This subclass is indented under subclass 678. Compounds which contain two or more hydroxy groups.
- 681 Halogen containing:**  
This subclass is indented under subclass 671. Compounds which contain halogen.
- 682 Purification or recovery:**  
This subclass is indented under subclass 681. Processes which include separating the compound from impurities or from the reaction mixture.
- 683 Fluorine:**  
This subclass is indented under subclass 681. Compounds which contain fluorine.
- 684 Additional diverse halogen containing:**  
This subclass is indented under subclass 683. Compounds which contain an additional different halogen.
- 685 Unsaturated:**  
This subclass is indented under subclass 683. Compounds which are acetylenically or ethylenically unsaturated.
- 686 Unsaturated:**  
This subclass is indented under subclass 681. Compounds which are acetylenically or ethylenically unsaturated.
- 687 Unsaturated:**  
This subclass is indented under subclass 671. Compounds which are acetylenically or ethylenically unsaturated.
- 688 Preparing by reacting an acyclic acetylenically unsaturated compound and an organic hydroxy containing compound (H of -OH may be substituted by M):**  
This subclass is indented under subclass 687. Processes which include preparing the compound by reacting an acyclic acetylenically unsaturated compound and an organic hydroxy containing compound.
- 689 Preparing by reacting an acyclic ethylenically unsaturated compound and an organic hydroxy containing compound (H of -OH may be substituted by M):**  
This subclass is indented under subclass 687. Processes which include preparing the compound by reacting an acyclic ethylenically unsaturated compound and an organic hydroxy containing compound.
- 690 Noble metal containing catalyst utilized:**  
This subclass is indented under subclass 689. Processes wherein a noble metal containing catalyst in any form is utilized.
- 691 Preparing from an acetal or ketal:**  
This subclass is indented under subclass 687. Processes which include preparing the compound by reacting an acetal or ketal.
- 692 Preparing by dehydrohalogenation:**  
This subclass is indented under subclass 687. Processes which include preparing the compound by removing hydrogen and halogen from a starting material.
- 693 Purification or recovery:**  
This subclass is indented under subclass 687. Processes which include separating the compound from impurities or from the reaction mixture.
- 694 Preparing by hydration of an olefin:**  
This subclass is indented under subclass 671. Processes wherein an olefin is hydrated to produce the compound.
- 695 Metal containing catalyst utilized:**  
This subclass is indented under subclass 694. Processes wherein a catalyst containing a metal in any form is utilized.
- 696 Sulfuric acid utilized:**  
This subclass is indented under subclass 694. Processes wherein sulfuric acid is utilized in the reaction.
- 697 Preparing by reacting an olefin and an organic hydroxy containing compound (H of -OH may be substituted by M):**  
This subclass is indented under subclass 671. Processes which include preparing the compound by reacting an olefin and an organic hydroxy containing compound.



**698 Preparing by dehydration of an organic hydroxy containing compound (H of -OH may be substituted by M):**

This subclass is indented under subclass 671. Processes which include preparing the compound by removing water from an organic hydroxy containing compound.

**699 Purification or recovery:**

This subclass is indented under subclass 671. Processes which include separating the compound from impurities or from the reaction mixture.

**700 Hydroxy containing (H of -OH may be replaced by a group IA or IIA light metal):**

This subclass is indented under subclass 300. Compounds which contain an -OH group or an -OM group, wherein M is a metal selected from Group I or II of the Periodic Table having a specific gravity less than 4 (i.e., Li, Na, K, Rb, Cs or Be, Mg, Ca, Sr, and Ba).

- (1) Note. -OM containing compounds are classified with the corresponding hydroxy containing compounds in the absence of a specific subclass providing for them. Subclass 851 is a specific subclass which provides for -OM containing compounds and, consequently, there are not any -OM containing compounds in subclasses 852 through 923.

**SEE OR SEARCH CLASS:**

556, Organic Compounds, subclasses 1+ for compounds containing an O-heavy metal, i.e., a metal having a specific gravity greater than 4 (e.g., radium, etc.), or 170+ for an O-aluminum group.

**701 With preservative or stabilizer:**

Products under subclass 700 wherein the -OH or -OM containing compound is mixed with a preserving agent which functions to prevent physical or chemical change.

**702 Benzene ring containing compound preserved:**

This subclass is indented under subclass 701. Products wherein the compound preserved contains a benzene ring.

**703 Acyclic polycarbon hydrocarbyl group bonded directly to the benzene ring:**

This subclass is indented under subclass 702. Compounds wherein an acyclic group which consists of hydrogen and carbon, with at least two carbons, is bonded directly to the benzene ring.

**704 Nitrogen containing:**

This subclass is indented under subclass 700. Compounds which contain nitrogen.

**705 Benzene ring containing:**

This subclass is indented under subclass 704. Compounds which contain a benzene ring.

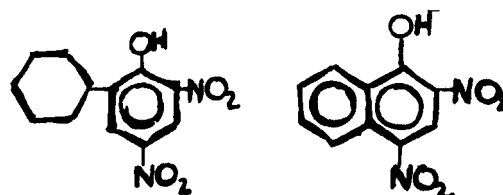
**706 Phenols (H of -OH may be replaced by a group IA or IIA light metal):**

This subclass is indented under subclass 705. Compounds wherein the benzene ring has an -OH or an -OM group bonded directly to the ring.

**707 Plural rings containing:**

This subclass is indented under subclass 706. Compounds which contain at least two rings.

- (1) Note. Some examples of compounds provided for by this subclass are:

**708 Purification or recovery:**

This subclass is indented under subclass 706. Processes which include separating the compound from impurities or from the reaction mixture.

**709 Halogen containing:**

This subclass is indented under subclass 706. Compounds which contain halogen.

**710 Polynitro:**

This subclass is indented under subclass 706. Compounds which contain at least two -NO<sub>2</sub> groups.

**711 Dinitro:**

This subclass is indented under subclass 710. Compounds which contain exactly two -NO<sub>2</sub> groups.

**712 Polyhydroxy nitro containing:**

This subclass is indented under subclass 704. Compounds which contain more than one -OH or -OM group and at least one -NO<sub>2</sub> group.

**713 Halogen containing:**

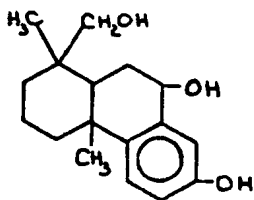
This subclass is indented under subclass 704. Compounds which contain halogen.

**714 Hydrophenanthrene containing:**

This subclass is indented under subclass 700. Compounds which contain a hydrophenanthrene ring system.

(1) Note. Included in this subclass are the abietyl alcohols of known chemical structure.

(2) Note. An example of a compound provided for herein is:

**715 Benzene ring containing:**

This subclass is indented under subclass 700. Compounds which contain a benzene ring.

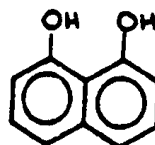
**716 Phenols (H of -OH may be replaced by a group IA or IIA light metal):**

This subclass is indented under subclass 715. Compounds wherein the -OH or -OM group is bonded directly to the benzene ring, forming a phenolic nucleus.

**717 Polyphenols:**

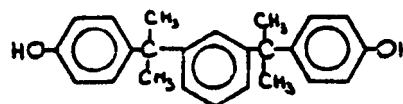
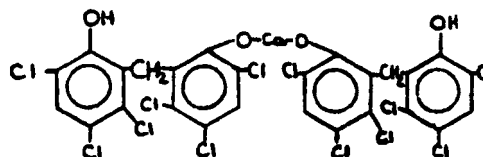
This subclass is indented under subclass 716. Compounds which contain at least two benzene rings each having -OH or -OM bonded directly thereto (i.e., at least two phenolic nuclei).

(1) Note. An example of the compounds provided for herein is:

**718 Three or more rings containing:**

This subclass is indented under subclass 717. Compounds which contain at least three rings.

(1) Note. Some examples of compounds provided for herein are:

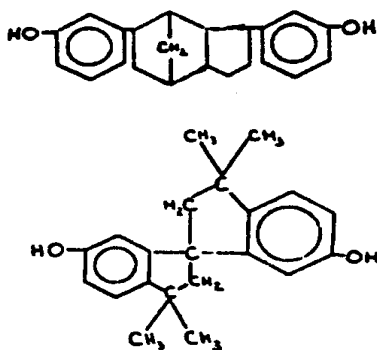


(2) Note. The third ring may be another phenol but is not required to be.

**719 Polycyclo ring system:**

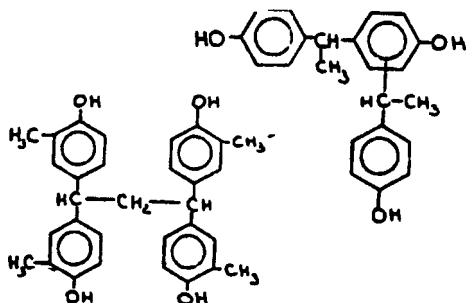
This subclass is indented under subclass 718. Compounds which contain a polycyclo ring system.

(1) Note. Some examples of compounds provided for herein are:

**720 Three or more phenols containing:**

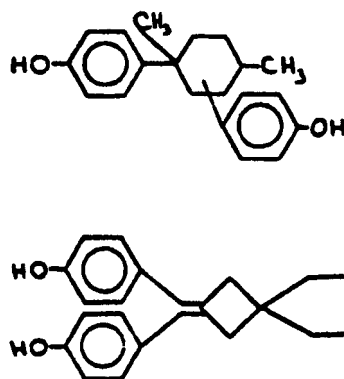
This subclass is indented under subclass 718. Compounds containing at least three benzene rings each having -OH or -OM bonded directly thereto.

- (1) Note. Exemplary of compounds provided for herein are:

**721 Alicyclic ring containing:**

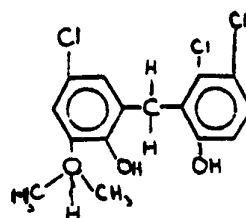
This subclass is indented under subclass 718. Compounds wherein one of the rings is alicyclic.

- (1) Note. Some examples of compounds provided for herein are:

**722 Two phenols bonded directly to the same carbon:**

This subclass is indented under subclass 717. Compounds which include two phenolic nuclei bonded directly to the same carbon.

- (1) Note. Exemplary of compounds provided for herein is:

**723 Identical phenols:**

This subclass is indented under subclass 722. Compounds wherein the two phenolic nuclei are identical (i.e., gem bivalent phenols).

**724 Purification or recovery:**

This subclass is indented under subclass 723. Processes which include separating the compound from impurities or from the reaction mixture.

**725 Halogen containing:**

This subclass is indented under subclass 724. Processes wherein the compound separated contains halogen.

**726 Halogen containing:**

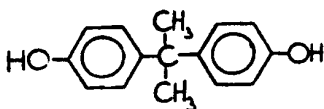
This subclass is indented under subclass 723. Compounds which contain halogen.

**727 Preparing from a phenol and an aldehyde or ketone:**

This subclass is indented under subclass 723. Processes wherein the compound is produced by reacting a phenol with an aldehyde or ketone.

**728 Isopropylidene diphenol produced:**

This subclass is indented under subclass 727. Processes wherein the compound produced is:

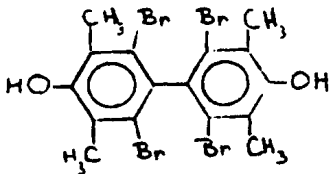
**729 Two phenols bonded directly to two different carbons of an acyclic chain:**

This subclass is indented under subclass 717. Compounds wherein two phenolic nuclei are bonded to different carbons of an acyclic chain.

**730 Two phenols bonded directly to each other:**

This subclass is indented under subclass 717. Compounds wherein two phenolic nuclei are bonded directly to each other.

(1) Note. Exemplary of compounds provided for in this subclass is:

**731 Additional ring containing:**

This subclass is indented under subclass 716. Compounds which contain an additional carbocyclic ring.

SEE OR SEARCH THIS CLASS, SUBCLASS:

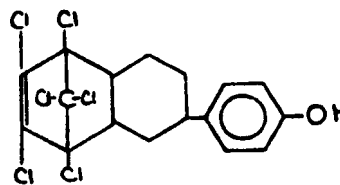
717, for compounds which contain plural phenolic nuclei.

**732 Polycyclo ring system:**

This subclass is indented under subclass 731. Compounds which contain a polycyclo ring system.

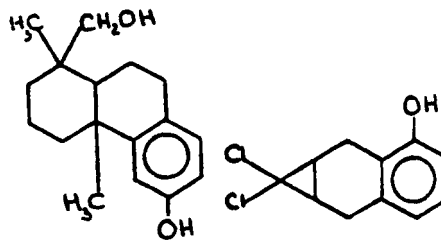
(1) Note. The phenolic nucleus may or may not be one of the cyclos in the polycyclo ring system.

(2) Note. An example of compounds provided for herein is:

**733 Tricyclo ring system:**

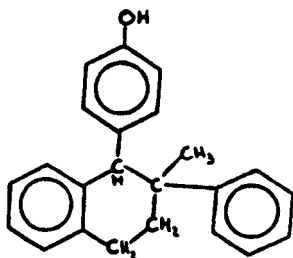
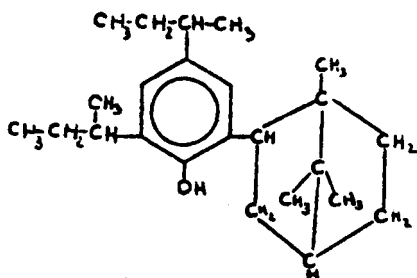
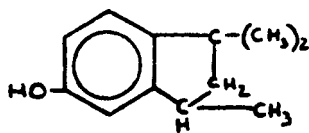
This subclass is indented under subclass 732. Compounds wherein the polycyclo ring system consists of three rings.

(1) Note. Some examples of compounds provided for by this subclass are:

**734 Bicyclo ring system:**

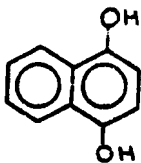
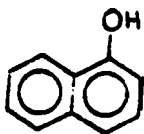
This subclass is indented under subclass 732. Compounds wherein the polycyclo ring system consists of two rings.

(1) Note. Some examples of compounds provided for herein are:

**735 Naphthols:**

This subclass is indented under subclass 734. Compounds wherein the bicyclo ring system consists of the phenolic nucleus and another benzene ring.

- (1) Note. Examples of compounds provided for herein are:



SEE OR SEARCH THIS CLASS, SUBCLASS:

719, for a polycyclic ring system having plural phenolic nuclei as cyclos.

**736 Acyclic hydrocarbyl group bonded directly to the bicyclo ring system:**

This subclass is indented under subclass 735. Compounds wherein an acyclic group which consists of hydrogen and carbon is bonded directly to the naphthol ring system.

**737 Halogen or polyhydroxy containing:**

This subclass is indented under subclass 735. Compounds which include halogen or at least two -OH groups.

**738 Preparing from aryl sulfonate:**

This subclass is indented under subclass 735. Processes wherein the compound is formed by reacting an aryl sulfonate.

- (1) Note. Included herein are processes which include the replacement of a sulfo or sulfonate group by an -OH or OM group, e.g., the fusion of a sulfonic acid of naphthalene with caustic soda.

**739 Preparing from compound which includes halogen bonded directly to a benzene ring:**

This subclass is indented under subclass 735. Processes wherein the compound is formed by reacting an aromatic halide.

**740 Preparing by dehydrogenation:**

This subclass is indented under subclass 735. Processes which include forming the compound by dehydrogenation.

**741 Preparing from peroxide or preparing by oxidation:**

This subclass is indented under subclass 735. Processes which include preparing the compound from a peroxide or by oxidation.

**742 Purification or recovery:**

This subclass is indented under subclass 735. Processes which include separating the naphthol from impurities or from the reaction mixture.

- 743 The additional ring is six-membered:**  
Compounds under 731 wherein the additional ring is six-membered.
- 744 The additional ring is benzene:**  
This subclass is indented under subclass 743. Compounds wherein the additional six-membered ring is benzene.
- 745 Halogen containing:**  
This subclass is indented under subclass 744. Compounds which contain halogen.
- 746 Rings bonded directly to each other:**  
This subclass is indented under subclass 745. Compounds wherein two rings are bonded directly to each other.
- 747 Rings bonded directly to each other:**  
This subclass is indented under subclass 744. Compounds wherein two rings are bonded directly to each other.
- 748 Purification or recovery:**  
Processes under 747 which include separating the compound from impurities or from the reaction mixture.
- 749 Purification or recovery:**  
This subclass is indented under subclass 716. Processes which include separating the phenol from impurities or from the reaction mixture.
- 750 From mixture of phenols:**  
This subclass is indented under subclass 749. Processes wherein the phenols are separated from a mixture of two or more phenols.
- 751 Plural phenols recovered separately:**  
This subclass is indented under subclass 750. Processes wherein at least two phenols are separately recovered from the mixture.
- 752 Three or more phenols recovered:**  
This subclass is indented under subclass 751. Processes wherein at least three phenols are recovered from the mixture.
- 753 Of polyhydroxy phenol:**  
This subclass is indented under subclass 749. Processes wherein the compound separated contains plural -OH groups.
- (1) Note. This subclass provides for processes directed to separating such compounds as resorcinol, pyrogallol, hydroquinone, catechol, etc.
- 754 Of Phenol prepared by cleavage of hydroperoxide or other peroxide:**  
This subclass is indented under subclass 749. Processes wherein the compound separated is one from the reaction mixture obtained by the catalytic decomposition of a hydroperoxide or some other peroxide.
- 755 Of halogen containing phenol:**  
This subclass is indented under subclass 749. Processes wherein the compound separated contains halogen.
- 756 Of phenol having acyclic polycarbon hydrocarbyl group bonded directly to the benzene ring:**  
This subclass is indented under subclass 749. Processes wherein the compound separated has an acyclic group which consists of hydrogen and carbon, with at least two carbons, bonded directly to the benzene ring.
- 757 Nitrogen or phosphorus containing compound utilized:**  
This subclass is indented under subclass 749. Processes wherein a nitrogen or phosphorus containing compound is utilized in the separation.
- 758 Sorbent material utilized:**  
This subclass is indented under subclass 749. Processes wherein the separation is made by adsorption or absorption.
- 759 From substance which includes sulfur or a sulfur containing compound:**  
This subclass is indented under subclass 749. Processes wherein the compound is separated from a substance which includes sulfur in elemental or compound form.
- 760 From ammoniacal liquor:**  
This subclass is indented under subclass 749. Processes wherein the compound is separated from a substance which includes ammonia.

**761 From oil or tar derived from fossil fuel or wood:**

This subclass is indented under subclass 749. Processes wherein the compound is separated from oil or tar derived from fossil fuel or wood.

- (1) Note. Included herein are processes of separating phenols from petroleum and tars from coke ovens or from the destructive distillation of wood, lignite, or coal.

**762 Alkali metal hydroxide utilized:**

This subclass is indented under subclass 761. Processes wherein a hydroxide of a Group IA metal is employed in the separation.

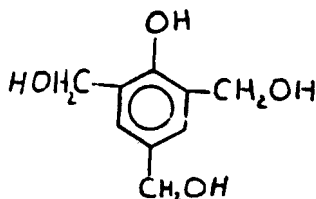
**763 Polyhydroxy (h of -oh may be replaced by a group IA or IIA light metal):**

This subclass is indented under subclass 716. Compounds which include an additional -OH or -OM group.

**764 Hydroxymethyl group containing:**

This subclass is indented under subclass 763. Compounds which contain a -CH<sub>2</sub>-OH group.

- (1) Note. Exemplary of the compounds provided for herein is:

**765 Halogen containing:**

This subclass is indented under subclass 763. Compounds which contain halogen.

**766 Acyclic polycarbon hydrocarbyl group bonded directly to the benzene ring:**

This subclass is indented under subclass 763. Compounds wherein an acyclic group which consists of hydrogen and carbon, with at least two carbons, is bonded directly to the benzene ring.

**767 Preparing from nitrogen containing compound:**

This subclass is indented under subclass 763. Processes which include reacting a nitrogen containing compound to produce the compound.

- (1) Note. This subclass provides for processes, for example, of preparing hydroquinone by the hydrogenation of a nitrobenzene to an amino product and the hydrolysis of the amino product to hydroquinone.

**768 Preparing by cleavage of hydroperoxide or other peroxide:**

This subclass is indented under subclass 763. Processes which include preparing the compound by the catalytic decomposition of a hydroperoxide or some other peroxide.

**769 Preparing from aryl sulfonate:**

This subclass is indented under subclass 763. Processes wherein the compound is formed by reacting an aryl sulfonate.

- (1) Note. Included herein are processes which include the replacement of sulfo or sulfonate groups, e.g., the alkali fusion of sodium meta-benzene disulfonate to prepare resorcinol.

**770 Preparing from compound which includes halogen bonded directly to a benzene ring:**

This subclass is indented under subclass 763. Processes which include reacting a compound which includes a halogen bonded directly to a benzene ring to produce the compound.

**771 Preparing by oxidation:**

This subclass is indented under subclass 763. Processes which include preparing the compound by oxidation.

- (1) Note. This subclass provides for processes wherein monohydric phenols are oxidized by hydrogen peroxide, organic peracids, or other oxidizing agents, in the presence of a catalyst.

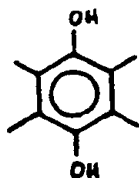
**772 Preparing by reduction or dehydrogenation (e.g., by hydrogenation, etc.):**

This subclass is indented under subclass 763. Processes which include preparing the compound by reduction or by dehydrogenation.

- (1) Note. Included herein are processes wherein functional groups, such as keto groups, in aromatic compounds are subjected to reduction by reducing agents such as zinc dust, caustic soda solution, or hydrogen in the presence of a hydrogenation catalyst; or wherein hydrogenated polyhydroxy carbocyclic compounds are dehydrogenated to polyhydroxy phenols.

**773 Preparing hydroquinones from an acetylene and carbon monoxide:**

This subclass is indented under subclass 763. Processes which include reacting an acetylene with carbon monoxide to form a compound which includes:

**774 Halogen containing:**

This subclass is indented under subclass 716. Compounds which contain halogen.

**775 Fluorine or iodine:**

This subclass is indented under subclass 774. Compounds wherein the halogen is fluorine or iodine.

**776 Three or more halogens bonded directly to the ring:**

This subclass is indented under subclass 774. Compounds which contain at least three halogens bonded directly to the ring.

**777 Preparing by hydrolysis:**

This subclass is indented under subclass 776. Processes which include preparing the compound by hydrolysis.

**778 Preparing by hydrolysis:**

This subclass is indented under subclass 774. Processes which include preparing the compound by hydrolysis.

**779 Preparing by halogenation:**

This subclass is indented under subclass 774. Processes which include preparing the compound by treating a phenol with a halogenating agent.

**780 Acyclic polycarbon hydrocarbyl group bonded directly to the benzene ring:**

This subclass is indented under subclass 716. Compounds wherein an acyclic group which consists of hydrogen and carbon, with at least two carbons, is bonded directly to the benzene ring.

**781 Isopropyl or isopropenyl group:**

This subclass is indented under subclass 780. Compounds which contain an isopropyl or isopropenyl group.

- (1) Note. Included herein are, for example, thymol, carvacrol, and 4-methyl-6-isopropenyl phenol.

**782 Preparing by reduction (e.g., by hydrogenation, etc.):**

This subclass is indented under subclass 781. Processes which include preparing the compound by reduction.

- (1) Note. Included herein, for example, are processes of reacting a compound with hydrogen or a hydrogen yielding substance in the presence of a catalyst.

**783 Preparing by isomerization:**

This subclass is indented under subclass 780. Processes wherein the compound is produced by transformation or rearrangement of the elements of a starting compound without adding or taking away any elements.

- (1) Note. Included herein are processes of isomerizing, for example, a para-alkyl phenol into an ortho-alkyl phenol.



- 784 Tertiary butyl group:**  
This subclass is indented under subclass 780. Compounds which contain a tertiary butyl group.
- 785 Preparing by catalytic alkylation:**  
This subclass is indented under subclass 784. Processes wherein the compound is formed in a reaction which adds an alkyl group to the starting material in the presence of a catalyst.
- 786 Silicon containing catalyst:**  
This subclass is indented under subclass 785. Processes wherein the catalyst contains silicon in any form.
- 787 Boron containing catalyst:**  
This subclass is indented under subclass 785. Processes wherein the catalyst contains boron in any form.
- 788 Sulfur containing catalyst:**  
This subclass is indented under subclass 785. Processes wherein the catalyst contains sulfur in any form.
- 789 Heavy Metal or aluminum containing catalyst:**  
This subclass is indented under subclass 785. Processes wherein the catalyst contains aluminum or a metal having a specific gravity greater than 4 in any form.
- 790 Preparing by catalytic alkylation:**  
This subclass is indented under subclass 780. Processes wherein the compound is formed in a reaction which adds an alkyl group to the starting material in the presence of a catalyst.
- 791 Silicon containing catalyst:**  
This subclass is indented under subclass 790. Processes wherein the catalyst contains silicon in any form.
- 792 Boron containing catalyst:**  
This subclass is indented under subclass 790. Processes wherein the catalyst contains boron in any form.
- 793 Sulfur containing catalyst:**  
This subclass is indented under subclass 790. Processes wherein the catalyst contains sulfur in any form.
- 794 Heavy metal or aluminum containing catalyst:**  
This subclass is indented under subclass 790. Processes wherein the catalyst contains aluminum or a metal having a specific gravity greater than 4 in any form.
- 795 Preparing from aryl sulfonate:**  
This subclass is indented under subclass 716. Processes wherein the phenol is formed by reacting an aryl sulfonate.
- (1) Note. Included herein are processes which include the replacement of a sulfo or sulfonate group on a benzene ring by an -OH or -OM group, e.g., the fusion of a sulfonic acid of benzene with caustic alkali.
- 796 Preparing from an compound which includes halogen bonded directly to a benzene ring:**  
This subclass is indented under subclass 716. Processes which include reacting a compound which includes a halogen bonded directly to a benzene ring to produce the compound.
- 797 Catalyst utilized:**  
This subclass is indented under subclass 796. Processes wherein a catalyst is utilized.
- 798 Preparing by cleavage of hydroperoxide or other peroxide:**  
This subclass is indented under subclass 716. Processes which include the decomposition of a hydroperoxide or some other peroxide to form the compound.
- 799 Preparing by reduction or dehydrogenation (e.g., by hydrogenation, etc.):**  
This subclass is indented under subclass 716. Processes which include forming the compound by reduction or dehydrogenation.
- 800 Preparing by oxidation:**  
This subclass is indented under subclass 716. Processes which include preparing the compound by oxidation.

**801 Of compound which contains a benzene ring and a -COO- group:**

This subclass is indented under subclass 800. Processes wherein the benzene ring containing starting compound also contains the following group:

**802 Molecular oxygen utilized:**

This subclass is indented under subclass 800. Processes wherein molecular oxygen is used.

**803 Peroxide or peracid utilized:**

This subclass is indented under subclass 800. Processes wherein a peroxide or a peracid is used.

- (1) Note. Included herein are oxidation processes using, for example, hydrogen peroxide or an organic carboxylic peracid oxidizing agent.

**804 Preparing by methylation:**

This subclass is indented under subclass 716. Processes wherein the compound is formed in a reaction which adds a methyl group to the starting material.

**805 Preparing by dealkylation:**

This subclass is indented under subclass 716. Processes which include preparing the compound by the removal of an alkyl group.

**806 Preparing by pyrolysis, (e.g., by cracking, etc.):**

This subclass is indented under subclass 716. Processes which include preparing the compound by decomposing an aromatic compound by heat.

**807 Additional ring containing:**

This subclass is indented under subclass 715. Compounds which contain at least one other carbocyclic ring.

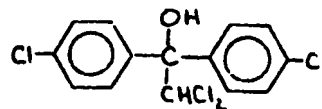
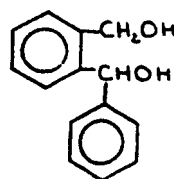
**808 Polycyclo ring system:**

This subclass is indented under subclass 807. Compounds which contain a polycyclo ring system.

**809 Plural benzene rings bonded directly to the same carbon:**

This subclass is indented under subclass 807. Compounds wherein plural benzene rings are bonded directly to the same carbon.

- (1) Note. Some examples of compounds provided for by this subclass are:

**810 Purification or recovery:**

This subclass is indented under subclass 715. Processes which include separating the compound from impurities or from the reaction mixture.

**811 Polyhydroxy (H of -OH may be replaced by a group IA or IIA light metal):**

This subclass is indented under subclass 715. Compounds which contain at least two -OH or -OM groups.

**812 Halogen containing:**

Compounds under 715 which contain halogen.

**813 Acyclic carbon to carbon unsaturation containing:**

This subclass is indented under subclass 715. Compounds which contain an acetylenically or ethylenically unsaturated side-chain.

**814 Preparing by reduction (e.g., by hydrogenation, etc.):**

This subclass is indented under subclass 715. Processes which include preparing the compound by reduction.

- (1) Note. Included herein are processes, for example, of reacting an aromatic compound containing a reducible functional group such as an aldehyde, ketone, ester, or acid chloride.

**815 Preparing from a peroxide or preparing by oxidation:**

This subclass is indented under subclass 715. Processes which include preparing the compound from a peroxide or by oxidation.

- (1) Note. Included herein are processes directed to the catalytic decomposition of organic hydroperoxides.

**816 Plural alicyclic rings containing:**

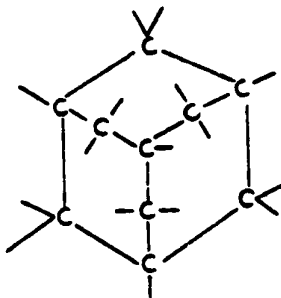
This subclass is indented under subclass 700. Compounds which contain at least two alicyclic rings.

**817 Polycyclo ring system:**

This subclass is indented under subclass 816. Compounds which contain a polycyclo ring system.

**818 Adamantane ring system:**

This subclass is indented under subclass 817. Compounds which contain a ring system of the structure:

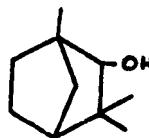
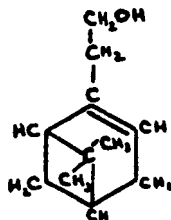
**819 Bicyclo ring system:**

This subclass is indented under subclass 817. Compounds wherein the polycyclo ring system consists of two rings.

**820 The two cyclos share at least three ring carbons (i.e., bridged ring):**

This subclass is indented under subclass 819. Compounds wherein the two rings share at least three carbons.

- (1) Note. Some examples of compounds provided for herein are:

**821 Containing alicyclic ring having at least seven members:**

This subclass is indented under subclass 700. Compounds which contain an alicyclic ring having seven or more ring carbons.

**822 Six-membered alicyclic ring containing:**

This subclass is indented under subclass 700. Compounds which include a six-membered alicyclic ring.

**823 Unsaturation in the ring:**

This subclass is indented under subclass 822. Compounds wherein the ring is partially unsaturated.

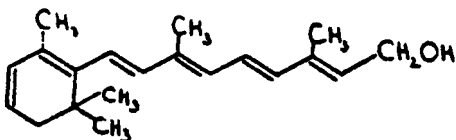
SEE OR SEARCH THIS CLASS, SUB-CLASS:

715+, for hydroxy compounds which contain a completely unsaturated six-membered ring.

**824 2,6,6-trialkylcyclohexenyls (e.g., vitamin a, etc.):**

This subclass is indented under subclass 823. Compounds which contain a 2,6,6-trialkylcyclohexenyl nucleus.

(1) Note. An example of a compound provided for herein is vitamin A:



**825 Single hydroxy containing (H of -OH may be replaced by a group IA or IIA light metal):**

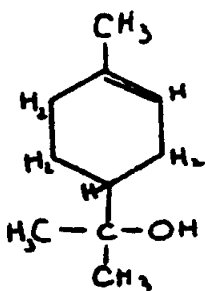
This subclass is indented under subclass 823. Compounds which have only one -OH or -OM group.

**826 The hydroxy is attached indirectly to the ring:**

This subclass is indented under subclass 825. Compounds wherein the -OH group is attached indirectly to the ring.

**827 Terpeneol:**

This subclass is indented under subclass 826. Compounds having the structure:



(1) Note. Included herein are processes for the preparation of unsubstituted terpeneol.

**828 Carbon to carbon unsaturation in substituent:**

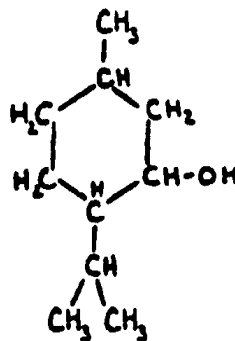
This subclass is indented under subclass 822. Compounds having an acetylenically or ethylenically unsaturated substituent attached to the ring.

**829 Menthols (H of -OH may be replaced by a group IA or IIA light metal):**

This subclass is indented under subclass 822. Compounds wherein a methyl group and an isopropyl group are bonded directly to the ring.

(1) Note. Included herein are the isomers and addition compounds of menthol.

(2) Note. An example of compounds provided for herein is:



**830 Preparing by reduction (e.g., hydrogenation, etc.):**

This subclass is indented under subclass 829. Processes which include preparing the compound by reduction.

(1) Note. Exemplary of processes provided for herein is the hydrogenation of thymol to menthol.

**831 Methylol cyclohexane (H of -OH may be replaced by a group IA or IIA light metal):**

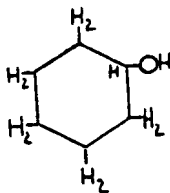
This subclass is indented under subclass 822. Compounds which include hydroxymethyl (HO.CH<sub>2</sub>-) bonded directly to cyclohexane.

**832 Hydroxy bonded directly to the ring (e.g., terpin hydrate, etc.)(H of -OH may be replaced by a group IA or IIA light metal):**  
This subclass is indented under subclass 822. Compounds wherein the -OH or -OM group is bonded directly to the ring.

**833 Cyclohexane polyol (e.g., inositol, etc.):**  
This subclass is indented under subclass 832. Compounds wherein at least two -OH groups are bonded directly to the ring.

**834 Polycarbon alkyl group containing:**  
This subclass is indented under subclass 832. Compounds which include an alkyl group having more than two carbons.

**835 Cyclohexanol per se:**  
This subclass is indented under subclass 832. Compounds which contain the structure:



(1) Note. Included herein are processes for the preparation of unsubstituted cyclohexanol.

**836 Preparing by oxidation:**  
This subclass is indented under subclass 835. Processes which include preparing the compound by oxidation.

**837 Boron containing material utilized:**  
This subclass is indented under subclass 836. Processes wherein a compound containing boron is utilized in the process.

**838 Five-membered alicyclic ring containing:**  
This subclass is indented under subclass 700. Compounds which include a five-membered alicyclic ring.

**839 Four-membered alicyclic ring containing:**  
This subclass is indented under subclass 700. Compounds which include a four-membered alicyclic ring.

**840 Acyclic:**  
This subclass is indented under subclass 700. Compounds which do not include a ring.

**841 Halogen Containing:**  
This subclass is indented under subclass 840. Compounds which include halogen.

**842 Flourine containing:**  
This subclass is indented under subclass 841. Compounds wherein the halogen is fluorine.

**843 Carbon to carbon unsaturation containing:**  
This subclass is indented under subclass 842. Compounds which include acetylenic or ethylenic unsaturation.

**844 Polyhydroxy or polyhalogen (H of -OH may be replaced by a group IA of IIA light metal):**  
This subclass is indented under subclass 841. Compounds which include at least two -OH or -OM groups or at least two halogens.

SEE OR SEARCH THIS CLASS, SUBCLASS:

841, for compounds containing only one -OH group and one halogen.

**845 Carbon to carbon unsaturation containing:**  
This subclass is indented under subclass 844. Compounds which include acetylenic or ethylenic unsaturation.

**846 Preparing from aldehyde or ketone:**  
This subclass is indented under subclass 844. Processes which include reacting an aldehyde or ketone to prepare the compound.

**847 Preparing from alkenyl halide:**  
This subclass is indented under subclass 844. Processes which include reacting a compound containing a halogen and ethylenic unsaturation to form the compound.

**848 Preparing from alkenol:**  
This subclass is indented under subclass 844. Processes which include reacting a compound containing an -OH group and ethylenic unsaturation to form the compound.

**849 Carbon to carbon unsaturation containing:**  
This subclass is indented under subclass 841. Compounds which include acetylenic or ethylenic unsaturation.

**850 Preparing from ethylenically unsaturated compound:**

This subclass is indented under subclass 841. Processes which include reacting a compound containing ethylenic unsaturation to form the compound.

**851 Oxy bonded directly to a group IA or IIA light metal:**

This subclass is indented under subclass 840. Compounds which include an -OM group bonded to carbon wherein M is a metal selected from Li, Na, K, Rb, Cs, Be, Mg, Ca, Sr, or Ba.

**852 Polyhydroxy:**

This subclass is indented under subclass 840. Compounds which contain at least two -OH groups.

(1) Note. This subclass provides for such compounds as glycerine, the glycols, the pinacones, etc.

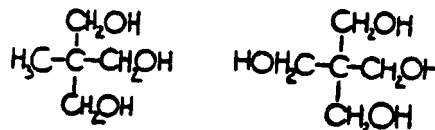
SEE OR SEARCH CLASS:

554, Organic Compounds, subclasses 156+ and 160 for processes which state that they are for the production of glycerine but are for no more than the hydrolysis or saponification of fats or fatty oils.

**853 Polyalkylol substituted alkane (e.g., pentaerythritol, trimethylolethane, etc.):**

This subclass is indented under subclass 852. Compounds wherein two or more alkylol groups (-R-OH, where R is alkyl) are bonded directly to carbon, which carbon has no hydrogen bonded directly thereto.

(1) Note. Examples of compounds provided for herein are:



**854 Purification or recovery:**

This subclass is indented under subclass 853. Processes which include separating the compounds from impurities or from the reaction mixture.

**855 Acetylenically unsaturated:**

This subclass is indented under subclass 852. Compounds which include acetylenic unsaturation.

**856 Purification or recovery:**

This subclass is indented under subclass 855. Processes which include separating the compound from impurities or from the reaction mixture.

**857 Ethylenically unsaturated:**

This subclass is indented under subclass 852. Compounds which include ethylenic unsaturation.

**858 Preparing by alcoholysis, hydrolysis, or saponification of an ester:**

This subclass is indented under subclass 852. Processes which include treating an ester with a compound which contains -OH (e.g., alcohol, water, NaOH, etc.) to form the compound.

**859 Preparing by hydrolysis or saponification of alkyl polyhalide or halohydrin:**

This subclass is indented under subclass 852. Processes which include treating an alkyl polyhalide or a halohydrin with a compound which contains -OH (e.g., water, NaOH, etc.) to prepare the compound.

**860 Preparing by hydroxylation at point of ethylenic unsaturation:**

This subclass is indented under subclass 852. Processes which include oxidizing an ethylenically unsaturated compound in the presence of water whereby hydroxy groups are added at a point of unsaturation.

- 861 Preparing by reduction (e.g., by hydrogenation, etc):**  
This subclass is indented under subclass 852. Processes which include preparing the compound by reduction.
- 862 Of aldehyde or ketone:**  
This subclass is indented under subclass 861. Processes wherein an aldehyde or a ketone is reduced.
- 863 Of polyhydroxy aldehyde or polyhydroxy ketone (e.g., of carbohydrate, glyceraldehyde, etc.):**  
This subclass is indented under subclass 862. Processes wherein the aldehyde or ketone reduced contains at least two -OH groups.
- (1) Note. This subclass provides for processes of reducing such substances as glucose, sucrose, maltose, etc.
- 864 Of compound containing a -COO- group:**  
This subclass is indented under subclass 861. Processes wherein a compound containing a O-group is reduced.
- 865 Of ether:**  
This subclass is indented under subclass 861. Processes wherein an ether is reduced.
- 866 Preparing from ether:**  
This subclass is indented under subclass 852. Processes which include reacting an ether to prepare the compound.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
865, for processes wherein an ether is reduced to form a polyhydroxy compound.
- 867 From alkylene oxide:**  
This subclass is indented under subclass 866. Processes wherein the ether is cyclic having a ring which consists of a single oxygen and two or more carbons.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
866, for processes wherein a substituted alkylene oxide, e.g., epichlorohydrin, is reacted to prepare the compound.
- 868 Purification or recovery:**  
This subclass is indented under subclass 852. Processes which include separating the compound from impurities or from the reaction mixture.
- 869 Of glycerol:**  
This subclass is indented under subclass 868. Processes wherein glycerol is separated.
- 870 Ion exchange or sorbent material utilized:**  
This subclass is indented under subclass 869. Processes which include utilizing an ion exchange material or a material capable of absorbing or adsorbing impurities or undesired components from glycerol.
- 871 Of spent ethylene glycol from polyester production:**  
This subclass is indented under subclass 868. Processes wherein the compound is separated from the excess or spent ethylene glycol used in the preparation of polyester.
- 872 Ion exchange or sorbent material utilized:**  
This subclass is indented under subclass 868. Processes which include utilizing an ion exchange material or a material capable of absorbing or adsorbing impurities or undesired components from the compound.
- 873 Acetylenically unsaturated:**  
This subclass is indented under subclass 840. Compounds which include acetylenic unsaturation.
- 874 Preparing from carbonyl containing compound:**  
This subclass is indented under subclass 873. Processes which include reacting a compound which contains the following group.
- 875 Terpenic, wherein the number of carbons is a multiple of five (e.g., linalool, farnesol, etc.):**  
This subclass is indented under subclass 840. Compounds which are derived from terpenes wherein the number of carbon atoms is a multiple of five.
- (1) Note. Examples of compounds provided for by this subclass are citronellol and geraniol.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
816+, 821, 822+, and 838, for alicyclic OH containing compounds derived from terpenes.
- 876 Preparing from carbonyl containing compound:**  
This subclass is indented under subclass 840. Processes which includereacting a compound which contains the following group.
- 877 By alcoholysis, hydrolysis, or saponification of an ester:**  
This subclass is indented under subclass 876. Processes which include treating an ester with a compound which contains -OH (e.g., alcohol, water, NaOH, etc.) to form the compound.
- 878 From aldehyde or ketone:**  
This subclass is indented under subclass 876. Processes wherein the carbonyl containing compound is an aldehyde or ketone.
- 879 By reaction of aldehyde with olefin (i.e., by prins reaction):**  
This subclass is indented under subclass 878. Processes which include reacting an aldehyde with an olefin.
- 880 By reduction (e.g., by hydrogenation, etc.):**  
This subclass is indented under subclass 878. Processes wherein the aldehyde or ketone is reduced.
- 881 Catalyst utilized:**  
This subclass is indented under subclass 880. Processes wherein a catalyst is utilized.
- 882 Including hydroformylation:**  
This subclass is indented under subclass 881. Processes which include the synthesis of the aldehyde or ketone by the addition of carbon monoxide and hydrogen to compounds containing ethylenic unsaturation.
- 883 Supported hydrogenation catalyst utilized:**  
This subclass is indented under subclass 882. Processes wherein a catalyst deposited or supported on a carrier material is used in a hydrogenation step.
- 884 By reduction (e.g., by hydrogenation, etc.):**  
This subclass is indented under subclass 876. Processes wherein the containing compound is reduced.
- (1) Note. This subclass includes, for example, the reduction of carboxylic acid esters with alkali metals.
- 885 Catalyst utilized:**  
This subclass is indented under subclass 884. Processes wherein a catalyst is utilized.
- 886 Preparing by alcoholysis, hydrolysis, or saponification of ester of polybasic inorganic acid:**  
This subclass is indented under subclass 840. Processes which include treating an ester of a polybasic inorganic acid with a compound which contains -OH (e.g., alcohol, water, NaOH, etc.)to form the compound.
- (1) Note. This subclass provides for processes wherein an olefin is first converted into an alkyl ester and subsequently subjected to hydrolysis.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
895+, for processes wherein olefins are hydrated with water, for example, steam, in the presence of a polybasic inorganic acid.
- 887 Boric acid:**  
This subclass is indented under subclass 886. Processes wherein boric acid or a boric acid ester is utilized.
- 888 Hydroxy compound produced has from one to six carbons:**  
This subclass is indented under subclass 886. Processes wherein the -OH containing compound produced has from one to six carbon atoms.
- 889 Isopropanol:**  
This subclass is indented under subclass 888. Processes wherein the -OH containing compound produced is isopropanol.



- 890 Ethanol:**  
This subclass is indented under subclass 888. Processes wherein the -OH containing compound produced is ethanol.
- 891 Preparing by hydrolysis of organic halide:**  
This subclass is indented under subclass 840. Processes wherein an organic halide is hydrolyzed to yield the compound.
- 892 Ethylenically unsaturated hydroxy compound produced:**  
This subclass is indented under subclass 891. Processes wherein an ethylenically unsaturated -OH containing compound is produced.
- 893 Including producing the organic halide reactant:**  
This subclass is indented under subclass 891. Processes which include the synthesis of the organic halide.
- (1) Note. Subjecting an olefin to the action of a hydrogen halide and reacting the resulting halide with water is an example of processes provided for herein.
- 894 Additional organic compound in reaction mixture:**  
This subclass is indented under subclass 891. Processes wherein the reaction mixture contains an organic compound in addition to the reactants.
- (1) Note. The additional organic compound in the reaction mixture may control the hydrolysis reaction or undesirable side reactions.
- 895 Preparing by hydration of olefin:**  
This subclass is indented under subclass 840. Processes wherein an olefin is hydrated to produce an -OH containing compound.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
886, for processes wherein an olefin is first converted into an ester of a polybasic inorganic acid which ester is subsequently hydrolyzed.
- 896 Supported catalyst utilized:**  
This subclass is indented under subclass 895. Processes wherein a catalyst deposited or supported on a carrier is utilized.
- 897 Aluminum containing catalyst utilized:**  
This subclass is indented under subclass 895. Processes wherein a catalyst containing aluminum, in any form, is utilized.
- 898 Phosphorus containing catalyst utilized:**  
This subclass is indented under subclass 895. Processes wherein a catalyst containing phosphorus, in any form, is utilized.
- 899 Sulfur containing catalyst utilized:**  
This subclass is indented under subclass 895. Processes wherein a catalyst containing sulfur, in any form, is utilized.
- 900 Heavy metal containing catalyst:**  
This subclass is indented under subclass 895. Processes wherein a catalyst containing a metal having a specific gravity greater than 4 is utilized.
- 901 Chromium, molybdenum, or tungsten:**  
This subclass is indented under subclass 900. Processes wherein the heavy metal is chromium, molybdenum, or wolfram.
- 902 Preparing from organic hydroxy containing reactant:**  
This subclass is indented under subclass 840. Processes which include forming the compound from an organic -OH containing reactant.
- 902.2** This subclass is indented under subclass 902. Processes of forming the acyclic hydroxy containing compound having fewer carbons in the chain. An example is, forming ethanol by reacting carbon monoxide and hydrogen with methanol.
- 903 By reduction, dehydration, or cleavage:**  
This subclass is indented under subclass 902. Processes wherein the organic -OH containing reactant is subjected to reduction, dehydration, or cleavage.

- 904 Olefin reacted with the hydroxy containing reactant (e.g., preparing by telomerization, etc.):**  
This subclass is indented under subclass 902. Processes wherein the organic -OH containing reactant is reacted with an olefin.
- 905 By condensation (e.g., guerbet reaction, etc.):**  
This subclass is indented under subclass 902. Processes which include combining two or more -OH containing reactants to form a single -OH containing compound.
- 906 By isomerization:**  
This subclass is indented under subclass 902. Processes wherein the compound is produced by transformation or rearrangement of an -OH containing reactant into an isomeric form.
- (1) Note. The transformation of 3-methyl-3-buten-1-ol into 2-methyl-3-buten-2-ol is an example of processes provided for herein.
- 907 Preparing from ether:**  
This subclass is indented under subclass 840. Processes which include reacting an ether to produce the compound.
- 908 Ethylenically unsaturated hydroxy compound produced:**  
This subclass is indented under subclass 907. Processes wherein an ethylenically unsaturated -OH containing compound is produced.
- 909 Preparing by carbonylation (e.g., by hydroformylation, etc.):**  
This subclass is indented under subclass 840. Processes which include reacting an olefin with carbon monoxide to produce the compound.
- (1) Note. Included herein are processes wherein an olefin is reacted with carbon monoxide and hydrogen in the presence of a catalyst.
- 909.5** This subclass is indented under subclass 840. Compounds which include carbon to carbon double bond.
- 909.8** This subclass is indented under subclass 840. Processes which include reacting an organic peroxide or a organic ozonide compound to produce the compound.
- 910 Preparing by oxidation:**  
This subclass is indented under subclass 840. Processes wherein the compound is produced by oxidation.
- 910.5 Of hydrocarbon mixtures:**  
This subclass is indented under subclass 910. Processes wherein a mixture of hydrocarbons is oxidized.
- 911 Of metal containing compound:**  
This subclass is indented under subclass 910. Processes wherein a metal containing reactant is oxidized.
- 912 Boron containing catalyst utilized:**  
This subclass is indented under subclass 910. Processes wherein a catalyst containing boron, in any form, is utilized.
- 913 Purification or recovery:**  
This subclass is indented under subclass 840. Processes which include separating the compound from impurities or from the reaction mixture.
- 914 By reduction (e.g., by hydrogenation, etc.):**  
This subclass is indented under subclass 913. Processes which include reduction to effect the separation.
- 915 By oxidation:**  
This subclass is indented under subclass 913. Processes which include oxidation to effect the separation.
- 916 By dehydration:**  
This subclass is indented under subclass 913. Processes which include dehydration to effect the separation.
- 917 By sorption:**  
This subclass is indented under subclass 913. Processes wherein the separation is made by adsorption or absorption.

**918 By plural liquid phase separation:**  
This subclass is indented under subclass 913. Processes wherein the -OH containing compound is recovered from a plural phase liquid mixture in which one phase has a high concentration of the -OH containing compound and another phase has a low concentration of the -OH containing compound.

**919 Alkali metal containing compound in one phase:**  
This subclass is indented under subclass 918. Processes wherein one phase contains or is treated with a Group IA metal containing compound.

**920 Alkali or alkaline earth metal containing compound utilized:**  
This subclass is indented under subclass 913. Processes wherein a compound containing a Group IA or IIA metal is used.

**921 Alkali metal hydroxide:**  
This subclass is indented under subclass 920. Processes wherein the compound is a Group IA metal hydroxide.

**922 Heavy metal or aluminum containing compound utilized:**  
This subclass is indented under subclass 913. Processes wherein a compound containing aluminum or a metal having a specific gravity greater than 4 is employed.

**923 By crystallization or hydroxy compound or by forming hydroxy containing addition compound:**  
This subclass is indented under subclass 913. Processes which include crystallizing the hydroxy compound or combining the hydroxy compound with a material to form an addition compound from which the desired -OH containing compound is recovered.

(1) Note. Included herein, for example, are processes of purifying an -OH containing compound by first reacting it with an aldehyde to form an acetal, isolating and saponifying the acetal into a pure -OH containing compound.

**924** This subclass is indented under subclass 300. Compounds which contain a -NO<sub>2</sub> group or an aci form thereof.

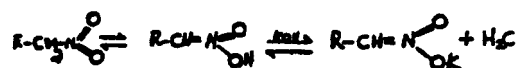
SEE OR SEARCH THIS CLASS, SUBCLASS:

926, for aci forms of nitro compounds.

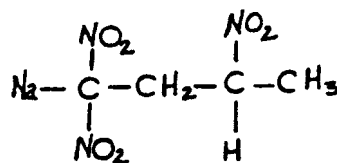
**925** This subclass is indented under subclass 924. Products wherein the compound is mixed with a preserving or stabilizing agent which functions to prevent physical or chemical change.

**926** This subclass is indented under subclass 924. Compounds which contain the group below, where R is hydrogen, an organic radical or a Group IA or IIA light metal; or nitro compounds which contain a Group IA or IIA light metal OR.

(1) Note. Included in this subclass are compounds wherein a nitro group has been converted into an acid form, the so-called aci form which is not a stable form, and is usually further converted into the salt form as in the following equation.



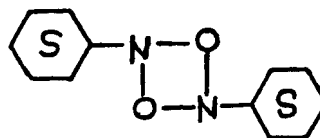
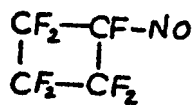
(2) Note. An example of other compounds provided for herein is:



**927** This subclass is indented under subclass 924. Compounds which contain a benzene ring.

**928** This subclass is indented under subclass 927. Compounds which contain at least two rings.

- 929** This subclass is indented under subclass 928. Compounds which contain a polycyclo ring system.
- 930** This subclass is indented under subclass 929. Compounds which contain at least two -NO<sub>2</sub> groups.
- 931** This subclass is indented under subclass 928. Compounds which contain at least two -NO<sub>2</sub> groups.
- 932** This subclass is indented under subclass 927. Compounds which contain at least two -NO<sub>2</sub> groups.
- 933** This subclass is indented under subclass 932. Compounds which contain halogen.
- 934** This subclass is indented under subclass 932. Compounds which contain only one methyl group and at least two nitros directly bonded to the benzene ring, with no other substituents on the ring.
- 935** This subclass is indented under subclass 934. Compounds which contain methyl group in the one position and nitro groups in positions two, four and six of the benzene ring.
- 936** This subclass is indented under subclass 927. Compounds which contain halogen.
- 937** This subclass is indented under subclass 936. Compounds wherein the halogen is directly bonded to the benzene ring.
- 938** This subclass is indented under subclass 937. Compounds wherein at least two halogens are directly bonded to the benzene ring.
- 939** This subclass is indented under subclass 927. Compounds wherein the -NO<sub>2</sub> group is directly bonded to the benzene ring.
- 940** This subclass is indented under subclass 939. Compounds which contain a methyl group bonded directly to the benzene ring.
- 941** This subclass is indented under subclass 924. Compounds which contain an alicyclic polycyclo ring system.
- 942** This subclass is indented under subclass 924. Compounds which contain a six-membered alicyclic ring.
- 943** This subclass is indented under subclass 924. Compounds which do not include a ring.
- 944** This subclass is indented under subclass 943. Compounds which contain at least two -NO<sub>2</sub> groups.
- 945** This subclass is indented under subclass 944. Compounds which contain halogen.
- 946** This subclass is indented under subclass 943. Compounds which contain halogen.
- 947** This subclass is indented under subclass 943. Compounds which consist of an alkane substituted by one -NO<sub>2</sub> group only.
- 948** This subclass is indented under subclass 947. The compounds of the formula: CH<sub>3</sub>NO<sub>2</sub>.
- 949** This subclass is indented under subclass 300. Compounds which contain a -NO group.
- (1) Note. Examples of compounds provided for herein are:



- 950** **Processes of oxidizing nonaromatic hydrocarbons; or purification or recovery of the products of such processes:**  
This subclass is indented under subclass 300. Processes which are directed to the oxidation on nonaromatic hydrocarbons or processes which include separating the products of the oxidation from impurities or from the reaction mixture.

(1) Note. Included herein are processes of oxidizing hydrocarbon mixtures, e.g., petroleum, fractional distillates of petroleum, paraffin, pine oil, turpentine, etc., to produce a mixture of oxygen-containing products, such as a mixture of esters, acids, aldehydes, ketones, and alcohols.

(2) Note. This subclass provides for producing oxygenated hydrocarbon mixtures broadly or mixtures of oxygen-containing compounds, such as a mixture of aldehydes, ketones, and alcohols, by oxidizing nonaromatic hydrocarbons. Oxidation of hydrocarbons to produce a specific compound is classified with the compound. In the situation where a "limited class of compounds" is produced, the patent is classified with that class of compounds and is assumed to be an acyclic compound. Some examples of such "limited class of compounds" are aldehydes, ketones, alcohols, and carboxylic acids. If "acids" are made by oxidizing nonaromatic hydrocarbon mixtures it is assumed an acyclic carboxylic acid results. Thus, if a process sets forth production of acids by oxidizing nonaromatic hydrocarbons, it is classified as an acyclic carboxylic acid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

398.8, for production of acyclic ketones by oxidation of hydrocarbon mixtures.  
469.9, for production of acyclic aldehydes by oxidation of hydrocarbon mixtures.  
910.5, for production of acyclic alcohols by oxidation of hydrocarbon mixtures.

SEE OR SEARCH CLASS:

208, Mineral Oils: Processes and Products, subclasses 3+ for oxidation treatment of a mineral oil substance, such as asphalt, where the object is to modify its general properties by oxidizing a portion thereof so that a heterogeneous mixture of hydrocarbons and oxidized hydrocarbons result.  
554, Organic Compounds, subclasses 132+ for producing fats, fatty oils, ester-type waxes or higher fatty acids by oxidation of hydrocarbon mixtures.

560, Organic Compounds, subclass 241.1 for producing carboxylic acid esters by oxidation of hydrocarbon mixtures.

562, Organic Compounds, subclass 512.2 and 512.4 for producing acyclic carboxylic acids by oxidation of hydrocarbon mixtures.

**951 Peroxy containing material utilized:**

This subclass is indented under subclass 950. Processes wherein a compound containing a -O-O- group is utilized in any way, e.g., as a reactant, catalyst, initiator, etc.

**952 Nitrogen or silicon containing compound utilized:**

This subclass is indented under subclass 950. Processes wherein a compound containing nitrogen or silicon is utilized in any way, e.g., as a reactant, catalyst, solvent, etc.

**953 Plural stages each having oxidation:**

This subclass is indented under subclass 950. Processes which include two or more oxidation steps.

**954 Liquid phase oxidation:**

This subclass is indented under subclass 950. Processes wherein the oxidation is carried out in the liquid state.

**955 Catalyst utilized:**

This subclass is indented under subclass 950. Processes which include employment of a catalyst.

**956 Heavy metal containing catalyst:**

This subclass is indented under subclass 955. Processes wherein a catalyst containing a metal having a specific gravity greater than four is utilized.

**957 Manganese containing catalyst:**

This subclass is indented under subclass 956. Processes wherein the catalyst contains manganese.

**958 Purification or recovery:**

This subclass is indented under subclass 950. Processes which include separating the compound(s) from impurities or from the reaction mixture.

**959 Oxidized hydrocarbons of undetermined structure:**

This subclass is indented under subclass 300. Products which include a mixture of oxygen containing hydrocarbons, such as esters, acids, aldehydes, ketones and alcohols.

- (1) Note. This subclass provides for product mixtures which are usually produced by the processes classified in subclasses 950+ of this class. See (1) Note and (2) Note of subclass 950 for what is to be considered a mixture and what is to be thought of as a compound for classification purposes in this subclass (959) as well as subclasses 950-958.

END