This Class 558 is considered to be an integral part of Class 260 (see the Class 260 schedule for the position of this Class in schedule hierarchy). This Class retains all pertinent definitions and class lines of Class 260.

ORGANIC COMPOUNDS (CLASS 532, SUBCLASS 1)

1 .Thioimidate esters (i.e., compounds having the thioimidate group, HN=CH-S-, wherein substitution may be made for hydrogen only, bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)

2 ..Chalcogen bonded directly to the carbon of the thioimidate group (e.g., HN=C(OH)-S-, wherein substitution may be made for hydrogen only)

3 ..Oxygen attached directly to the nitrogen of the thioimidate group by nonionic bonding (i.e., HO-N=CH-S-, wherein substitution may be hydrogen only)

4 ..Nitrogen bonded directly to the carbon of the thioimidate group (i.e., pseudothioureas, HN=C(HNH)-S-, wherein substitution may be made for hydrogen only)

5 ...Chalcogen attached indirectly to the thioimidate group by acyclic nonionic bonding

6 .Imidate esters (i.e., compounds having the imidate group, HN=CH-O-, wherein substitution may be made for hydrogen only, bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)

7 ..Oxygen attached directly to the nitrogen of the imidate group by nonionic bonding (i.e., HO-N=CH-O-, wherein substitution may be made for hydrogen only)

8 ..Nitrogen bonded directly to the carbon of the imidate group (i.e., pseudoureas, HN=C(HNH)-O-, wherein substitution may be made for hydrogen only)

9 ..Carbon bonded directly to the nitrogen of the imidate group (e.g., N cyanoimidates, etc.)

10 .Thiocyanate esters (i.e., compounds having the thiocyano group, -SCN, bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)

11 ..Plural thiocyano groups attached to each other indirectly by nonionic bonding

12 ..Thiocyano and the carbonyl carbon of a -COO- group are attached to the same carbon or to a chain consisting of carbons, which chain may include ring members (e.g., terpene thiocyanoacyl compounds, etc.)

13 ..Thiocyano bonded directly to a benzene ring

14 ..Nitrogen or carbonyl attached indirectly to the thiocyano group by acyclic nonionic bonding

15 ..Sulfur or halogen attached indirectly to the thiocyano group by acyclic nonionic bonding

16 ..Oxygen attached indirectly to the thiocyano group by acyclic nonionic bonding

17 .Isothiocyanate esters (i.e., compounds containing the isothiocyanate group, -N=C=S, bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)

18 ..Processes for forming the isothiocyanate group

19 ...Thiocyano, isocyanate, or isocyanide dihalide group containing compound utilized (i.e., -SCN, -N=C=O, or -N=CXX containing compound utilized wherein X is halogen)

20 .Sulfate esters (i.e., compounds having the sulfate group, -O-S(=O)(=O)O-, bonded directly to at least one carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)
21 ..With preservative or stabilizer
22 ..Phosphorus attached directly or indirectly to the sulfate group by nonionic bonding
23 ..Chalcogen bonded directly to the sulfate group
24 ..Plural sulfate groups attached indirectly to each other by nonionic bonding
25 ...Nitrogen attached indirectly to a sulfate group by acyclic nonionic bonding
26 ...Additional chalcogen attached indirectly to a sulfate group by acyclic nonionic bonding
27 ..Quaternary nitrogen containing
28 ...Having -C(=X)-, wherein X is chalcogen, attached indirectly to the quaternary nitrogen
29 ..Nitrogen attached indirectly to the sulfate group by acyclic nonionic bonding
30 ...Having -C(=X)-, wherein X is chalcogen, bonded directly to the nitrogen
31 ..Chalcogen attached indirectly to the sulfate group by acyclic nonionic bonding
32 ...The chalcogen, X, is part of a -C(=X)- group
33 ...The chalcogen is bonded directly to a ring
34 ...Plural chalcogens attached indirectly to the sulfate group by acyclic nonionic bonding
35 ..Halogen attached indirectly to the sulfate group by acyclic nonionic bonding
36 ..Acyclic carbon chain containing carbon to carbon unsaturation attached directly to the sulfate group by nonionic bonding
37 ..Benzene ring attached directly or indirectly to the sulfate group by nonionic bonding
38 ..Plural alkyl groups, or hydrogen and an alkyl group, bonded directly to the sulfate group, wherein the hydrogen may be replaced by substituted or unsubstituted ammonium, or by a Group IA or IIA light metal (e.g., ethyl hydrogen sulfate, methyl ammonium sulfate, diethyl sulfate, etc.)
39 ...Processes
40 ....Heavy metal containing material utilized (e.g., as catalyst, promoter, etc.)
41 ....Reactant contains alcoholic -OH group (wherein H of -OH may be replaced by substituted or unsubstituted ammonium, or by a Group IA or IIA light metal)
42 ....Reactant contains acyclic or alicyclic carbon to carbon double bond
43 ....Purification or recovery
44 .Sulfonate esters (i.e., compounds having the sulfonate group, -O-S(=O)(=O) , wherein the single bonded oxygen is bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)
45 ..Phosphorus attached directly or indirectly to the sulfonate group by nonionic bonding
46 ..Plural sulfonate groups attached indirectly to each other by nonionic bonding
47 ...Nitrogen attached directly or indirectly to a sulfonate group by nonionic bonding
48 ..Nitrogen attached directly or indirectly to the sulfonate group by acyclic nonionic bonding
49 ...The nitrogen is bonded directly to -C(=X)-, wherein X is chalcogen
50 ....Additional nitrogen attached directly or indirectly to the -C(=X)- group by acyclic nonionic bonding

51 ..Chalcogen attached indirectly to the sulfonate group by acyclic nonionic bonding
52 ...The chalcogen, X, is in a -C(=X)- group
53 ..Halogen attached directly or indirectly to the sulfonate group by acyclic nonionic bonding
54 ...Plural halogens attached indirectly to the sulfonate group by acyclic bonding
55 ..Acyclic carbon chain containing carbon to carbon unsaturation attached directly to the sulfonate group by nonionic bonding
56 ..Benzene ring bonded directly to the sulfonate group
57 ...Alicyclic ring attached directly or indirectly to the sulfonate group by nonionic bonding
58 ...Additional benzene ring containing
59 .Sulfite esters (i.e., compounds having the sulfite group, -O-S(=O)O-, bonded directly to at least one carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)
60 ..Chalcogen attached indirectly to the sulfite group by acyclic nonionic bonding
61 .Sulfinate esters (i.e., compounds having the sulfinate group, -O-S(=O)-, wherein the single bonded oxygen is bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)
62 .Sulfenate esters (i.e., compounds having the sulfenate group, -S-O-, wherein the oxygen is bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)
70 .Phosphorus esters (i.e., compounds having the phosphorus ester group, wherein trivalent or pentavalent phosphorus and carbon are bonded directly to the same divalent chalcogen, and wherein the carbon may be single bonded to any atom but may be multiple bonded only to carbon)
71 ..With preservative or stabilizer
72 ..Boron containing
73 ..The phosphorus is in a ring
74 ...Ring phosphorus is shared by two rings
75 ....Phosphorus and nitrogen in the same ring
76 ...Additional phosphorus containing ring
77 ....Phosphorus, and two chalcogens bonded directly thereto, in the same ring (e.g., cyclic phosphonates, etc.)
78 .....Acyclic divalent chalcogen single bonded directly to the ring phosphorus (e.g., cyclic phosphites, etc.)
79 ......And divalent chalogen double bonded directly to the ring phosphorus (e.g., cyclic phosphates, etc.)
80 ...And nitrogen in the ring
81 ....And chalcogen or carbon in the ring
82 ...And carbon and chalcogen in the ring
83 ....Plural chalcogens in the ring
84 .....The ring phosphorus is attached directly to halogen or an acyclic nitrogen by nonionic bonding
85 .....Acyclic divalent chalcogen single bonded directly to the ring phosphorus (e.g., cyclic phosphites, etc.)
86 ......And divalent chalcogen double bonded directly to the ring phosphorus (e.g., cyclic phosphates, etc.)
87 ..Processes
88 ...Isomerization
89 ...Forming the phosphorus ester group

90 ....Reactant having halogen attached directly to phosphorus by nonionic bonding
91 .....And reactant having chalcogen-containing hetero ring
92 .....And reactant having alcoholic or phenolic -XH group, wherein X is chalcogen (and wherein H of -XH may be replaced by substituted or unsubstituted ammonium, or by a Group IA or IIA light metal)
93 ......And nitrogen bonded directly to the phosphorus in the phosphorus containing reactant
94 ....Four or five halogens attached directly to the phosphorus in the phosphorus containing reactant by nonionic bonding
95 ....The phosphorus in the reactant is trivalent
96 ....Nitrogen containing compound utilized (e.g., pyridine, carbamates, urea, etc., utilized as catalysts, proton acceptors, etc.)
97 ....Trivalent phosphorus converted into pentavalent phosphorus
98 ....And carbon bonded directly to the phosphorus in the phosphorus containing reactant (e.g., methyl phosphonodichloride, etc.)
99 ....And divalent chalcogen single bonded directly to the phosphorus in the phosphorus containing reactant (e.g., diethyl phosphorochloridate, etc.)
100 ....Nitrogen containing compound utilized (e.g., pyridine, carbamates, urea, etc., utilized as catalysts, proton acceptors, etc.)
101 ....Nitrogen containing compound utilized (e.g., pyridine, carbamates, urea, etc., utilized as catalysts, proton acceptors, etc.)
102 ....Metal containing material utilized (e.g., as catalysts, etc.)
103 .....And reactant having -C(=X)-, wherein X is chalcogen
104 ....Reactant has -XH, wherein X is chalcogen, bonded directly to phosphorus (wherein H of -XH may be replaced by substituted or unsubstituted ammonium, or by a Group IA or IIA light metal)
105 .....And reactant having three-membered hetero ring
106 .....And reactant having halogen bonded directly to carbon, which carbon may be single bonded to any element but may be multiple bonded only to carbon
107 ....Having -C(=X)-, wherein X is chalcogen, or cyano attached indirectly to the halogen by acyclic nonionic bonding
108 .....And -C(=X)- containing reactant, wherein X is chalcogen
109 .....And unsaturated hydrocarbon reactant (e.g., pinene, allylene, etc.)
110 .....And reactant having alcoholic or phenolic -XH group, wherein X is chalcogen (and wherein H of -XH may be replaced by substituted or unsubstituted ammonium, or by a Group IA or IIA light metal)
111 .....Additional diverse phosphorus containing reactant
112 ....Reactant consists of phosphorus and sulfur (e.g., phosphorus pentasulfide, etc.)
113 ....Reactant consists of phosphorus and oxygen (e.g., phosphorus pentoxide, etc.)
114 .....And reactant having alcoholic or phenolic -XH group, wherein X is chalcogen (and wherein H of -XH may be replaced by substituted or unsubstituted ammonium, or by a Group IA or IIA light metal)
115 ....Trivalent phosphorus converted into pentavalent phosphorus

116 .....Reactant having halogen and -C(=X)-, wherein X is chalcogen, bonded directly to the same carbon (e.g., alpha halo carbonyl compounds, etc.)
117 ....Reactant is a phosphorus ester (e.g., transesterification, etc.)
118 .....And reactant having alcoholic or phenolic -XH group, wherein X is chalcogen (and wherein X of -XH may be replaced by substituted or unsubstituted ammonium, or by a Group IA or IIA light metal)
119 ......The -XH is bonded directly to alkyl
120 .....The phosphorus ester reactant has hydrogen or metal bonded directly to phosphorus
121 ....Elemental phosphorus reactant
122 ...Trivalent phosphorus converted into pentavalent phosphorus
123 ....Molecular oxygen or elemental sulfur reactant (e.g., air, etc.)
124 ....Reactant having halogen bonded directly to carbon (e.g., Arbuzov rearrangement, etc.)
125 .....The reactant contains carbon to carbon unsaturation
126 ....Reactant having -C(=X)-, wherein X is chalcogen
127 ...Forming a linkage wherein divalent chalcogen is bonded directly to two phosphori (e.g., forming the pyrophosphate linkage, etc.)
128 ....Reactant having halogen attached directly to phosphorus by nonionic bonding
129 ...Forming or utilizing an -O-O- or -S-S- group
130 ...Forming P-X-C(=X)- group, wherein the X's may be the same or different chalcogens and the phosphorus may be trivalent or pentavalent
131 ...Converting a phosphorus ester group to a P-XH group, wherein H of -XH may be replaced by substituted or unsubstituted ammonium or by a Group IA or IIA light metal, and wherein X is chalogen and P may be trivalent or pentavalent
132 ...Forming phosphorus to chalcogen bond
133 ...Replacing H of P-XH with substituted or unsubstituted ammonium, or with a Group IA or IIA light metal, and wherein X is chalcogen and P is trivalent or pentavalent
134 ...Substituting carbon for halogen, hydrogen, or metal bonded directly to the phosphorus
135 ....Aldehyde or ketone reactant
136 ....Reactant having halogen bonded directly to carbon (e.g., ethyl bromide, benzoyl chloride, etc.)
137 ....Reactant having acyclic or alicyclic carbon to carbon unsaturation
138 ...Forming phosphorus to nitrogen bond
139 ...Forming a -C(=X)NHH or -N=C=O group, wherein X is chalcogen and substitution may be made for hydrogen only
140 ...Forming nonionic phosphorus to halogen bond
141 ...Halogenation of carbon
142 ...Forming carbon to carbon multiple bond
143 ...Utilizing oxirane ring containing compound
144 ...Reactant having halogen or nitrogen attached directly to phosphorus by nonionic bonding
145 ...Reactant having nitrogen attached indirectly to phosphorus by nonionic bonding
146 ...Purification or recovery
147 ....Of compounds having plural phosphori
148 ....Of compounds having halogen attached directly to phosphorus by nonionic bonding
149 ....Oxidation employed to purify or recover

150 ....Metal containing material utilized or separated
151 ..Oxygen single bonded to oxygen, or sulfur single bonded to sulfur (e.g., peroxy compounds, etc.)
152 ..Plural phosphori bonded to the same chalcogen (e.g., pyrophosphate esters, etc.)
153 ..Phosphorus and a -C(=X)- group, wherein X is chalcogen, bonded directly to the same chalcogen
154 ..Hydrazine, or substituted hydrazine, group attached directly or indirectly to the phosphorus by nonionic bonding (i.e., HHN-NH- group, wherein substitution may be made for hydrogen only)
155 ..Plural phosphori attached directly or indirectly to each other by nonionic bonding
156 ...Plural phosphorus ester groups
157 ....Nitrogen bonded directly to phosphorus
158 ....Nitrogen attached indirectly to phosphorus by acyclic nonionic bonding
159 .....Having -C(=X)-, wherein X is chalcogen, bonded directly to the nitrogen
160 ....Having -C(=X)-, wherein X is chalcogen, attached indirectly to phosphorus by acyclic nonionic bonding
161 ....Divalent chalcogen double bonded directly to pentavalent phosphorus
162 .....Plural phosphori attached indirectly to each other by a benzene ring or by a chain which includes a benzene ring
163 .....Plural phosphori attached indirectly to each other by an acyclic chalcogen containing chain
164 ......Plural chalcogens in the acyclic chain
165 ....Divalent chalcogen, bonded directly to two carbons or to carbon and hydrogen, attached indirectly to phosphorus by acyclic nonionic bonding (wherein the hydrogen may be replaced by substituted or unsubstituted ammonium, or by a Group IA or IIA light metal)
166 ..Nitrogen attached indirectly to the phosphorus by acyclic nonionic bonding
167 ...The nitrogen is part of a cyano or isocyano group
168 ....Chalcogen attached indirectly to the phosphorus by acyclic nonionic bonding
169 ...Chalcogen attached indirectly to the phosphorus by acyclic nonionic bonding
170 ....The chalcogen, X, is in a -C(=X)- group, which group is bonded directly to the nitrogen
171 .....Nitrogen bonded directly to the phosphorus
172 .....The -C(=X)- is part of a -C(=X)X- group, wherein the X's may be the same or diverse chalcogens
173 .....Chalcogen, or additional -C(=X), bonded directly to the nitrogen
174 .....Two carbons bonded directly to the same chalcogen (e.g., sulfones, carboxylic acid esters, ethers, etc.)
175 ....Chalcogen bonded directly to the nitrogen by nonionic bonding
176 ...Containing carbon double bonded to nitrogen
177 ..Chalcogen attached indirectly to the phosphorus by acyclic nonionic bonding
178 ...The chalcogen, X, is in a -C(=X)- group
179 ....The -C(=X)- is part of a -C(=X)X- group, wherein the X's are the same or diverse chalcogens
180 .....Plural -C(=X)X- groups attached indirectly to the phosphorus by acyclic nonionic bonding

181 .....The carbon of the -C(=X)X- group is bonded directly to the phosphorus or to nitrogen which is bonded directly to the phosphorus
182 .....Acyclic carbon chain containing carbon to carbon unsaturation attached directly or indirectly to the phosphorus by acyclic nonionic bonding
183 ...Plural carbons bonded directly to the same chalcogen which is attached indirectly to the phosphorus by acyclic nonionic bonding (e.g., ethers, etc.)
184 ....The chalcogen is part of a -S(=O)- or a -S(=O)(=O)- group (e.g., sulfones, etc.)
185 ....Nitrogen bonded directly to the phosphorus
186 ....Plural ether oxygens or thioether sulfurs attached indirectly to the phosphorus by acyclic nonionic bonding
187 ....The chalcogen is bonded directly to a benzene ring and to acyclic carbon
188 ....Halogen attached directly or indirectly to the phosphorus by acyclic nonionic bonding
189 ....Carbon bonded directly to the phosphorus
190 ..Nitrogen attached indirectly to the phosphorus by nonionic bonding
191 ...Nitrogen or halogen attached directly to the phosphorus by nonionic bonding
192 ...Cyano or isocyano attached indirectly to the phosphorus by nonionic bonding
193 ...Nitro bonded directly to a benzene ring
194 ..Chalcogen attached indirectly to the phosphorus by nonionic bonding
195 ...Nitrogen or halogen attached directly to the phosphorus by nonionic bonding
196 ...The chalcogen is part of a -S(=O)- or a -S(=O)(=O)- group (e.g., sulfoxides, sulfonic acids, etc.)
197 ...Ether oxygen or thioether sulfur bonded directly to a benzene ring
198 ...The chalcogen, X, is in a -C(=X)- group
199 ..Nitrogen bonded directly to the phosphorus
200 ...Benzene ring and the phosphorus bonded directly to the same chalcogen (i.e., the carbon of the phosphorus ester group is part of a benzene ring)
201 ...Acyclic carbon chain containing carbon to carbon unsaturation attached indirectly to the phosphorus by acyclic nonionic bonding
202 ..Halogen attached directly to the phosphorus by nonionic bonding
203 ..Halogen attached indirectly to the phosphorus by acyclic nonionic bonding
204 ...Plural fluorines bonded to an acyclic carbon or to an acyclic carbon chain
205 ...Carbon to carbon unsaturation containing
206 ....The unsaturation is in a benzene ring
207 ..Divalent chalcogen double bonded directly to the phosphorus
208 ...And three divalent chalcogens single bonded directly to the phosphorus (e.g., trialkyl phosphates, etc.)
209 ....Alicyclic ring bonded directly to one of the chalcogens
210 ....Benzene ring bonded directly to one of the chalcogens
211 .....Benzene ring bonded directly to each of the three chalcogens
212 .....Three or more halogens bonded directly to the benzene ring
213 ....Multiple bond between two acyclic carbons
214 ...And two divalent chalcogens single bonded directly to the phosphorus
215 ....Benzene ring bonded directly to one of the chalcogens

216 ....Benzene ring bonded directly to the phosphorus
217 ....Multiple bond between two acyclic carbons
218 ..Three divalent chalcogens single bonded directly to trivalent phosphorus (e.g., trialkyl phosphites, etc.)
230 .Esters having the thiocarboxylate group, -C(=X)X-, wherein the X's are the same or diverse chalcogens, with at least one X being sulfur, and wherein the single bonded X is bonded directly to an additional carbon, which carbon may be single bonded to any atom, but may be multiple bonded only to carbon
231 ..Phosphorus attached directly or indirectly to the thiocarboxylate group by nonionic bonding
232 ..Nitrogen bonded directly to the carbon of the -C(=X)X- group (e.g., thiocarbamates, etc.)
233 ...Chalcogen, nitrogen, or additional -C(=X)- attached directly to the nitrogen by nonionic bonding (X is chalcogen)
234 ...The -C(=X)X- is -C(=S)O-
235 ...The -C(=X)X- is -C(=S)S-
236 ....Nitrogen or additional chalcogen attached indirectly to the nitrogen by acyclic nonionic bonding
237 .....Plural HHN-C(=S)S- groups, wherein substitution may be made for hydrogen only
238 .....Cyano or -C(=X)-, wherein X is chalcogen, attached indirectly to the nitrogen by acyclic nonionic bonding
239 ...Nitrogen or additional chalcogen attached indirectly to the nitrogen by acyclic nonionic bonding
240 ....The chalcogen, X, is in a -C(=X)- group
241 ...Benzene ring bonded directly to the nitrogen or to the sulfur of a -C(=O)S- group
242 ...Benzene ring attached indirectly to the nitrogen by nonionic bonding
243 ..Esters having the -X-C(=X)X- group, wherein the X's are the same or diverse chalcogens and at least one X is sulfur, and wherein one of the single bonded X's is bonded directly to carbon, which carbon may be single bonded to any atom, but may be multiple bonded only to carbon (e.g., thiocarbonates, etc.)
244 ...Two -C(=X)- groups, wherein the X's are the same or diverse chalcogens, bonded directly to the same chalcogen or to a chain consisting of chalcogens (e.g., xanthic disulfides, etc.)
245 ...The -X-C(=X)X- is -S-C(=S)O- (e.g., xanthates, etc.)
246 ....Nitrogen or chalcogen attached indirectly to the -S-C(=S)O- group by acyclic nonionic bonding
247 ....Alkyl and hydrogen bonded directly to the -S-C(=S)O- group, wherein the hydrogen may be replaced by substituted or unsubstituted ammonium or by a Group IA or IIA light metal (e.g., sodium ethyl xanthate, etc.)
248 ...The -X-C(=X)X- is -S-C(=O)O- (e.g., thiolcarbonates, etc.)
249 ..Halothiocarbonate esters (i.e., compounds wherein halogen is bonded directly to the carbon of the -C(=X)X- group)
250 ..The -C(=X)X- is -C(=O)S-
251 ...Plural -C(=O)S- groups containing
252 ...Chalcogen attached indirectly to the -C(=O)S- group by acyclic nonionic bonding
253 ....The chalcogen, X, is in a -C(=X)- group
254 .....Nitrogen bonded directly to the -C(=X)- group
255 .....The -C(=X)- group is part of a -COO- group
256 ...Nitrogen attached indirectly to the -C(=O)S- group by acyclic nonionic bonding

257 ...Benzene ring attached directly or indirectly to the -C(=0)S- group by nonionic bonding
260 .Carbonate esters (i.e, compounds having the -O-C(=O)O- group bonded directly to at least one carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)
261 ..With preservative or stabilizer
262 ..Nitrogen attached directly to the -O-C(=O)O- group by nonionic bonding (e.g., oxime carbonates, urea carbonates, etc.)
263 ..Oxygen bonded directly to the -O-C(=O)O- group by nonionic bonding (e.g., monoperoxycarbonates, etc.)
264 ...Carbonyl bonded directly to the oxygen (i.e., compounds having the -O-C(=O) O-O-C(=O)- group; e.g., peroxydicarbonates, acyl peroxycarbonates, etc.)
265 ..Plural -O-C(=O)O- groups attached indirectly to each other by nonionic bonding
266 ...Additional chalcogen attached indirectly to one of the -O-C(=O)O- groups by acyclic nonionic bonding
267 ....The additional chalcogen, X, is in a -C(=X)- group
268 ...Benzene ring attached directly or indirectly to one of the -O-C(=O)O- groups by nonionic bonding
269 ....Nitrogen attached directly or indirectly to the benzene ring by nonionic bonding
270 ..Benzene ring bonded directly to the -O-C(=O)O- group
271 ...Additional chalcogen bonded directly to the benzene ring
272 ...Nitrogen bonded directly to the benzene ring
273 ...Nitrogen or additional chalcogen attached indirectly to the benzene ring by acyclic nonionic bonding
274 ...Two benzene rings bonded directly to the -O-C(=O)O- group (i.e., diaryl carbonates)
275 ..Benzene ring attached indirectly to the -O-C(=O)O- group by nonionic bonding
276 ..Nitrogen or chalcogen attached indirectly to the -O-C(=O)O- group by acyclic nonionic bonding
277 ..Two identical or diverse alkyl groups bonded directly to the -O-C(=O)O- group (e.g., dimethyl carbonate, methyl ethyl carbonate, etc.)
280 .Halocarbonate esters (i.e., compounds having the halo-C(=O)O- group bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)
281 ..Plural halo-C(=O)O- groups attached indirectly to each other by nonionic bonding
282 ..Benzene ring attached directly or indirectly to the halo-C(=O)O- group by nonionic bonding
283 ..Halogen attached indirectly to the halo-C(=O)O- group by nonionic bonding
285 .Thioborate esters (i.e., compounds having boron and carbon each single bonded to the same divalent sulfur, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)
286 .Borate esters (i.e., compounds having boron and carbon each single bonded to the same oxygen, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)
287 ..Boron and oxygen in the same ring
288 ...Carbon in the ring
289 ....Nitrogen in the ring
290 ....Plural rings each having boron, carbon and oxygen as ring members
291 ....Three oxygens attached directly to the same boron by nonionic bonding

292 ..Plural acyclic borons attached directly or indirectly to each other by nonionic bonding
293 ..Three oxygens attached directly to the same boron by nonionic bonding
294 ...Benzene ring attached indirectly to boron by nonionic bonding
295 ...Nitrogen or chalcogen attached indirectly to boron by acyclic nonionic bonding
296 ...Trialkyl borates (i.e., compounds having the structure (RO)B(OR)(OR), wherein the R's represent the same or diverse alkyl groups
297 ....Processes utilizing boric oxide or an inorganic boric acid
298 ..Carbon bonded directly to the boron
299 .Nitrile oxides or nitrile imines (i.e., compounds having cyano bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon, and wherein the nitrogen of the cyano group is bonded directly to oxygen or to nitrogen)
300 .Cyano single bonded and nitrogen or phosphorus double bonded to the same carbon atom (e.g., alpha-imino nitriles, etc.)
301 ..Oxygen bonded directly to the double bonded nitrogen (e.g., alpha-oximino nitriles, etc.)
302 .Isonitriles (i.e., compounds having an isonitrile group, usually represented as -N=C, bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)
303 .Nitriles (i.e., compounds having cyano bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon)
304 ..With preservative or stabilizer
305 ...Acyclic or alicyclic carbon to carbon unsaturation in the preserved or stabilized nitrile
306 ....Organic compound, which contains nitrogen, utilized as preservative or stabilizer
307 ....Sulfur or phosphorus containing preservative or stabilizer
308 ..Processes for forming the cyano group
309 ...Hetero ring containing reactant
310 ....Nitrogen, or oxygen, and carbonyl carbon are adjacent ring members of the hetero ring (e.g., lactams, lactones, etc.)
311 ...Reactant is a carboxylic acid, or an amide, anhydride, ester, halide, or salt thereof
312 ....Utilizing a formamide, heavy metal salt, aluminum halide, organosilicon compound, organophosphorus compound, or a compound containing nitrogen and sulfur
313 ....Liquid phase reaction
314 ...Utilizing nitryl halide, nitrosyl halide, HCH=NO- or HHNO- (wherein substitution may be made for hydrogen only; e.g., oximes, oxime esters, hydroxylamine salts, olefin-nitrosyl chloride adducts, etc.)
315 ...Reactant is an aldehyde or ketone, or a compound having carbon double bonded to nitrogen (e.g., ammoxidation of acrolein, etc.)
316 ...Reactant contains -OH bonded directly to acyclic or alicyclic carbon (wherein H of -OH may be replaced by substituted or unsubstituted ammonium, or by a Group IA or IIA light metal)
317 ...Utilizing a nitrogen oxide or an azide
318 ...Ammonia utilized
319 ....And molecular oxygen or a molecular oxygen containing gas

320 .....Acting on a compound containing acyclic or alicyclic carbon to carbon unsaturation
321 ......Niobium, tantalum, silver, sulfur, ruthenium, rhodium, palladium, osmium, iridium, or platinum containing material utilized
322 ......Tellurium containing material utilized
323 ......Molybdenum containing material utilized
324 ....Bismuth containing material utilized
325 ......Antimony containing material utilized
326 ....Uranium or arsenic containing material utilized
327 .....Acting on a benzene ring-containing compound
328 ......Alkali metal containing material utilized
329 ....Product contains cyano bonded directly to a benzene ring
330 ....Reactant contains acyclic or alicyclic carbon to carbon double bond
331 ..Homopolymerization of HCN (e.g., tetramerization of HCN to diaminomaleonitrile)
332 ..Processes of attaching cyano to carbon by reaction of an inorganic cyanide with an organic compound (e.g., using HCN, cyanogen, metal cyanide, ammonium cyanide, cyanogen chloride, etc.)
333 ...The organic compound contains a carbon to carbon triple bond (e.g., acrylonitrile from acetylene and HCN, etc.)
334 ....Liquid phase reaction (e.g., using aqueous CuCl catalyst, etc.)
335 ...The organic compound contains an acyclic or alicyclic carbon to carbon double bond
336 ....Cyanogen or cyanogen halide utilized
337 ....The organic compound contains halogen bonded directly to carbon
338 ....Organic material which contains phosphorus, arsenic, or antimony, in addition to nickel, utilized (e.g., zero-valent nickel complexes, etc.)
339 ....Cobalt, copper, silver, or gold containing material utilized
340 ....Ruthenium, rhodium, palladium, osmium, iridium, or platinum containing material utilized
341 ....The organic compound contains a carbonyl (e.g., ketene, etc.)
342 ...Replacing halogen with cyano
343 ....On benzene ring
344 ....Organic compound of nitrogen, phosphorus, arsenic, antimony, or bismuth utilized other than as reactant (e.g., utilizing phase transfer agents, etc.)
345 ...Aldehyde, and carboxylic acid halide or carboxylic acid anhydride, reacted with the inorganic cyanide
346 ...Aldehyde or ketone, and ammonia or substituted ammonia, reacted with the inorganic cyanide
347 ...Hetero ring containing compound reacted with the inorganic cyanide (e.g., reaction of epoxy compounds, etc.)
348 ...Replacing hydrogen with cyano (e.g., malononitrile from acetonitrile, etc.)
349 ....On benzene ring (e.g., benzonitrile from benzene, etc.)
350 ...Replacing oxygen or nitrogen, single bonded to carbon, by cyano
351 ...Attaching cyano to the carbonyl carbon of an aldehyde or ketone (e.g., cyanohydrin formation, etc.)
352 ...Carboxylic acid, carboxylic acid halide, carboxylic acid anhydride, or compound containing carbon double bonded to nitrogen reacted with the inorganic cyanide
353 ..Processes utilizing carbon monoxide as a reactant

354 ..Racemization, resolution, or inversion of configuration processes for optically active compounds
355 ..Isomerization processes (e.g., double bond shift, cis-trans isomerism, etc.)
356 ...Isomerization of reactants containing plural cyano groups
357 ..Processes of forming carbon to carbon bond between carbons of two organic reactants
358 ...Reactions utilizing epoxy compounds, or free radical reactions (e.g., utilizing peroxy or azo promotors, etc.)
359 ...The carbons that form the bond each lose halogen in the process
360 ...The carbon to carbon bond forms between plural molecules of identical nitrile reactants (e.g., dimerization, etc.)
361 ....The reactant is an acyclic nitrile containing carbon to carbon unsaturation (e.g., dimerization or oligomerization of acrylonitrile, etc.)
362 .....Amalgam utilized
363 .....Organic phosphorus compound utilized
364 .....Heavy metal or aluminum containing material utilized
365 ...Formation of a carbocyclic ring
366 ....Three- or four-membered monocyclic ring formed
367 ...Cyanoalkylation of an acyclic or alicyclic carbon, which is adjacent to a benzene ring or an atom double or triple bonded to a non-carbon atom, by means of acrylonitrile or hydrocarbyl-substituted acrylonitrile (e.g., cyanoethylation, etc.)
368 ....The cyanoalkylated carbon is adjacent to a carbonyl carbon
369 ...Alkylation of an acyclic or alicyclic carbon, which is adjacent to a benzene ring or an atom double or triple bonded to a non-carbon atom, by means of an alkyl halide, alkyl sulfate, substituted alkyl halide or substituted alkyl sulfate
370 ...Reactant contains two cyano groups bonded directly to the same unsaturated carbon
371 ...Aldehyde or ketone reactant
372 ....Formaldehyde reactant
373 ....Carbonyl carbon of the aldehyde or ketone reacts to form a carbon to carbon double bond with carbon of a second reactant
374 .....The carbon of the second reactant is bonded directly to two atoms which are each double or triple bonded to noncarbon atoms
375 ...Carbon to carbon double bond is formed between a nitrile reactant having no acyclic or alicyclic carbon to carbon double bond and a second reactant
376 ...Hydrogen bonded to a benzene ring is replaced by carbon
377 ...A nitrile reactant and a second reactant each contain an acyclic or alicyclic carbon to carbon double bond
378 ...A nitrile reactant contains no acyclic or alicyclic carbon to carbon unsaturation
379 ..Processes of forming an acyclic or alicyclic carbon to carbon double bond from an existing acyclic or alicyclic carbon to carbon single bond (e.g., by dehydroacylation, etc.)
380 ...By dehydrohalogenation
381 ...By dehalogenation, dehydrocyanation, ring cleavage, or depolymerization
382 ...By dehydration (i.e., removal of water)
383 ...By dehydrogenation
384 ..Boron or spiro containing
385 ..Phosphorus attached indirectly to the cyano group by nonionic bonding

386 ...Chalcogen, nitrogen, or halogen bonded directly to the phosphorus by nonionic bonding
387 ..Oxygen single bonded to oxygen, or sulfur single bonded to sulfur (e.g., peroxy compounds, etc.)
388 ..Benzene ring attached indirectly to the cyano group by acyclic nonionic bonding
389 ...Non-carbon atom in acyclic chain between the benzene ring and the cyano group
390 ....Nitrogen in the acyclic chain
391 .....Carbon, also in the chain, double bonded to the nitrogen
392 .....Having -C(=X)-, also in the chain, bonded directly to the nitrogen (wherein X is chalcogen)
393 ......Carbon to carbon unsaturation, chalcogen, or additional nitrogen in the chain
394 .....The chain nitrogen bonded directly to the benzene ring
395 ......Cyano or carbonyl bonded directly to an acyclic carbon which is double bonded to another carbon
396 ....Sulfur in the chain
397 .....Oxygen double bonded to the sulfur
398 ....Having -COO- in the chain
399 .....The carbon of the -COO- group is bonded directly to the benzene ring
400 .....Cyano or carbonyl bonded directly to an acyclic carbon which is double bonded to another carbon
401 ...Benzene ring and cyano connected by a chain consisting of two carbons multiple bonded to each other
402 ....Additional benzene ring bonded directly to the chain
403 ....Nitrogen, except as nitro or nitroso, bonded directly to the benzene ring
404 ...Having -C(=X)-, wherein X is chalcogen, attached indirectly to the cyano group by nonionic bonding
405 ....Two carbons bonded directly to the carbon of the -C(=X)- group (e.g., ketones, etc.)
406 ....Oxygen bonded directly to carbonyl (e.g., carboxylic acid esters, etc.)
407 .....Three-membered carbocyclic ring containing
408 ...Nitrogen, except as nitro or nitroso, attached indirectly to the cyano group by nonionic bonding
409 ....Plural cyano groups containing
410 ...Oxygen attached indirectly to the cyano group by nonionic bonding (e.g., nitro group, etc.)
411 ..Benzene ring bonded directly to the cyano group
412 ...Sulfur and hydroxy bonded directly to the same benzene ring, or containing a monocyclic unsaturated alicyclic ring or thiocarbonyl
413 ...Sulfur, double bonded to oxygen, attached indirectly to the cyano group by nonionic bonding
414 ...Carbonyl attached indirectly to the cyano group by nonionic bonding
415 ....Benzene ring bonded directly to the carbonyl
416 .....Oxygen bonded directly to the carbonyl (e.g., benzoic acid esters, etc.)
417 ....The carbonyl is bonded directly to two non-carbon atoms, or to a non-carbon atom and an additional carbonyl (e.g., carbamates, oxamides, etc.)
418 ...Nitrogen, except as nitro or nitroso, attached indirectly to the cyano group by nonionic bonding
419 ....Plural cyano groups containing
420 .....Plural benzene rings bonded directly to cyano groups
421 .....Plural cyano groups bonded directly to a benzene ring, which is further unsubstituted or hydrocarbyl substituted only

422 ....The nitrogen is attached indirectly to a benzene ring by acyclic nonionic bonding
423 ...Oxygen attached indirectly to the cyano group by nonionic bonding
424 ....Two benzene rings bonded directly to the same oxygen, or nitrogen bonded directly to oxygen (e.g., nitro compounds, phenoxyphenyl compounds, etc.)
425 ...Halogen attached indirectly to the cyano group by nonionic bonding
426 ..Benzene ring attached indirectly to the cyano group by nonionic bonding (i.e., alicyclic ring between the benzene ring and the cyano group)
427 ...Polycyclo ring system having at least three cyclos, at least one of which is a benzene ring
428 ..Polycyclo alicyclic ring system containing
429 ...The ring system contains at least three cyclos
430 ..Six-membered alicyclic ring containing
431 ...Cyano bonded directly to the ring
432 ..Five-membered alicyclic ring containing
433 ..Four-membered alicyclic ring containing
434 ..Three-membered alicyclic ring containing
435 ..Acyclic (e.g., purification of saturated nitriles, etc.)
436 ...Sulfur attached indirectly to the cyano group by nonionic bonding
437 ....The sulfur is double bonded to oxygen
438 ....Two carbons bonded directly to the same divalent sulfur
439 .....Additional cyano group
440 ...Carbonyl attached indirectly to the cyano group by nonionic bonding (e.g., aldehydes, ketones, etc.)
441 ....Oxygen bonded directly to the carbonyl group (e.g., carboxylic acid esters, etc.)
442 .....Additional carbonyl attached indirectly to the cyano group by nonionic bonding
443 .....The cyano group is bonded directly to the carbon adjacent to the carbonyl carbon (e.g., alpha cyano acrylates, etc.)
444 .....The oxygen is between the carbonyl and the cyano group (e.g., cyano is in the alcohol portion of a carboxylic acid ester, etc.)
445 ....Nitrogen bonded directly to the carbonyl (e.g., ureas, etc.)
446 ...Nitrogen, double bonded to carbon, attached indirectly to the cyano group by nonionic bonding (e.g., imines, oximes, etc.)
447 ...Plural carbons bonded directly to the same oxygen
448 ....Plurals oxygens bonded directly to the same carbon (e.g., acetals, etc.)
449 ....Cyano is attached directly or indirectly by nonionic bonding to carbon that is multiple bonded to another carbon
450 ....Processes for formation of an ether group (e.g., cyanoethylation of alcohols, etc.)
451 ...Having -OH bonded directly to carbon (wherein H of -OH may be replaced by substituted or unsubstituted ammonium, or by a Group IA or IIA light metal) by dehydroacylation, etc.)
452 ...Nitrogen attached indirectly to the cyano group by nonionic bonding
453 ....Plural cyano groups bonded directly to the same carbon (e.g., malononitrile, tetracyanoethylene, etc.)
454 ....Plural cyano groups bonded directly to the same chain (e.g., adiponitrile, etc.)
455 .....The chain contains nitrogen (e.g., iminodiacetonitrile, nitrilotriacetonitrile, etc.)

456 .....Purification or recovery of saturated hydrocarbon dinitriles (e.g., from mixtures with cyanocyclopentanonimine, 2-cyanocyclopenten-1-ylamine, etc.)
457 .....A carbon in the chain is multiple bonded to carbon (e.g., 1,4 dicyanobutene, etc.)
458 ....The nitrogen is attached directly to halogen by nonionic bonding, or is part of a nitro, nitroso, nitrate, or N-oxide group
459 ....Hydrogenation of dinitriles, or displacement of halo, hydroxy, or alkoxy by ammonia or substituted ammonia
460 ...Halogen attached indirectly to the cyano group by nonionic bonding
461 ....Plural halogens attached indirectly to the cyano group by nonionic bonding
462 ...Carbon to carbon unsaturation containing
463 ....Purification or recovery
464 .....Utilizing ion exchange resin, or a silicon, aluminum, or heavy metal containing material
465 .....Of nitriles prepared by hydrocyanation (e.g., by reaction of acetylene with hydrogen cyanide, etc.)
466 .....Of nitriles prepared by reaction of an organic compound, ammonia, and molecular oxygen or a molecular oxygen-containing gas (i.e., of nitriles prepared by ammoxidation)
467 ...Processes for preparation of saturated nitriles
480 .Nitrate esters or chalcogen analogues thereof (i.e., compounds having (X=)N(=X)-X- bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon; the X's may be the same or diverse chalcogens)
481 ..With preservative or stabilizer
482 ..Benzene ring containing
483 ..Additional nitrogen or chalcogen containing
484 ...Plural (X=)N(=X)-X- groups containing
485 ....Four or more (X=)N(=X)-X- groups containing
486 ....Glyceryl trinitrate per se (i.e., trinitroglycerin)
487 ....Containing nitrogen bonded directly to carbon
488 .Nitrite esters or chalcogen analogues thereof (i.e., compounds having (X=)N X- bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon; the X's may be the same or diverse chalcogens)

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