

<p>This Class 548 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.</p> <p><b>ORGANIC COMPOUNDS (CLASS 532, SUBCLASS 1)</b></p> <p><b>.HETEROCYCLIC CARBON COMPOUNDS CONTAINING A HETERO RING HAVING CHALCOGEN (I.E., OXYGEN, SULFUR, SELENIUM, OR TELLURIUM) OR NITROGEN AS THE ONLY RING HETERO ATOMS (Class 540, subclass 1)</b></p> <p>100 ..Hetero ring is five-membered having two or more ring hetero atoms of which at least one is nitrogen (e.g., selenazoles, etc.)</p> <p>101 ...Heavy metal or aluminum containing</p> <p>102 ....Arsenic containing</p> <p>103 ....The metal is bonded directly to carbon, which carbon is a ring carbon of the five-membered hetero ring or which carbon is attached directly or indirectly to the five-membered hetero ring by nonionic bonding</p> <p>104 ....The metal is bonded directly to chalcogen of a -C(=X)X-group, wherein the X's are the same or diverse chalcogens, which group is attached directly or indirectly to the five-membered hetero ring by nonionic bonding</p> <p>105 ....The metal is bonded directly to chalcogen which chalcogen is attached directly to the five-membered hetero ring by nonionic bonding</p> <p>106 ....The metal is bonded directly to chalcogen which chalcogen is attached indirectly to the five-membered hetero ring by nonionic bonding</p>	<p>107 ....The metal is in an anion and the five-membered hetero ring is in a cation</p> <p>108 ....Polycyclo ring system having the five-membered hetero ring as one of the cyclos</p> <p>109 ....Azide or acyclic nitrogen containing</p> <p>110 ...Boron or silicon containing</p> <p>111 ...Phosphorus attached directly to the five-membered hetero ring by nonionic bonding</p> <p>112 ...Phosphorus attached indirectly to the five-membered hetero ring by nonionic bonding</p> <p>113 ....Polycyclo ring system having the five-membered hetero ring as one of the cyclos</p> <p>114 ....The polycyclo ring system and phosphorus are both bonded directly to the same chalcogen</p> <p>115 ....The five-membered hetero ring and phosphorus are both bonded directly to the same nitrogen</p> <p>116 ....The five-membered hetero ring and phosphorus are both bonded directly to the same chalcogen</p> <p>117 ....The five-membered hetero ring contains chalcogen as a ring hetero atom</p> <p>118 ....The five-membered hetero ring contains at least three ring nitrogens</p> <p>119 ...The phosphorus is part of a substituent which is attached directly to ring carbon of the five-membered hetero ring</p> <p>120 ...The five-membered hetero ring contains ring selenium and is one of the cyclos in a polycyclo ring system</p> <p>121 ...Bicyclo ring system having the five-membered hetero ring as one of the cyclos</p> <p>122 ...The five-membered hetero ring consists of sulfur, oxygen, nitrogen, and carbon</p> <p>123 ...Plural ring sulfurs in the five-membered hetero ring</p> <p>124 ...Plural ring oxygens in the five-membered hetero ring</p> <p>125 ...The five-membered hetero ring consists of chalcogen, plural nitrogens, and carbon</p>
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126	....Polycyclo ring system having the five-membered hetero ring as one of the cyclos	144	....Chalcogen bonded directly to ring carbon of the oxadiazole ring
127	....1,2,3-thiadiazoles (including hydrogenated)	145	....Plural carbocyclic rings bonded directly to the oxadiazole ring
128	....1,2,4-thiadiazoles (including hydrogenated)	146	...1,3-thiazoles (including hydrogenated)
129	....Chalcogen bonded directly to ring carbon of the thiadiazole ring	147	....Spiro
130	.....Nitrogen or additional chalcogen bonded directly to ring carbon of the thiadiazole ring	148	....Polycyclo ring system having the thiazole ring as one of the cyclos
131	....1,2,4-oxadiazoles (including hydrogenated)	149	....Tetracyclo ring system having the thiazole ring as one of the cyclos
132	....Chalcogen bonded directly to ring carbon of the oxadiazole ring	150	....Tricyclo ring system having the thiazole ring as one of the cyclos
133	....Nitrogen attached directly to the oxadiazole ring by nonionic bonding	151	.....At least three ring hetero atoms in the tricyclo ring system
134	....1,2,5-thiadiazoles (including hydrogenated)	152	....Bicyclo ring system having the thiazole ring as one of the cyclos
135	....Chalcogen or nitrogen attached directly to ring carbon of the thiadiazole ring by nonionic bonding	153	.....At least three ring hetero atoms in the bicyclo ring system
136	....1,3,4-thiadiazoles (including hydrogenated)	154	.....Ring nitrogen is shared by the two cyclos
137	....Diazole ring attached directly to the thiadiazole ring by nonionic bonding	155	.....Tetramisole per se or salt thereof (including hydrogenated)
138	....Nitrogen attached directly to the thiadiazole ring by nonionic bonding	156	.....Plural benzothiazoles (including hydrogenated)
139	.....Having $-C(=X)-$ , wherein X is chalcogen, attached directly to the nitrogen by nonionic bonding	157	.....Chalcogen bonded directly to ring carbon of the thiazole ring
140	.....Additional nitrogen attached directly to the $-C(=X)-$ group by nonionic bonding	158	.....Plural benzothiazole ring systems bonded directly to chain consisting of plural sulfurs
141	.....Chalcogen or additional nitrogen attached directly to ring carbon of the thiadiazole ring by nonionic bonding	159	.....Additional polycyclo heterocyclic ring system containing
142	....Chalcogen bonded directly to the 2- and 5- positions of the thiadiazole ring	160	.....Polycyclo-carbocyclic ring system having at least three cyclos
143	....1,3,4-oxadiazoles (including hydrogenated)	161	.....Nitrogen attached directly to the thiazole ring by nonionic bonding
		162	.....The nitrogen is a ring hetero atom

163	.....Carbonyl or thiocarbonyl bonded directly to the nitrogen	183	.....Plural chalcogens bonded directly to ring carbons of the thiazole ring
164	.....The nitrogen bonded additionally only to hydrogen	184	.....Nitrogen attached directly to the thiazole ring by nonionic bonding
165	.....Chalcogen bonded directly to ring carbon of the thiazole ring	185	.....Having -C(=X)-, wherein X is chalcogen, bonded directly to nitrogen
166	.....Chalcogen bonded directly to the chalcogen	186	.....Chalcogen attached indirectly to the thiazole ring by nonionic bonding
167	.....Nitrogen attached directly to the chalcogen by nonionic bonding	187	.....The chalcogen, X, is in a -C(=X)- group
168	.....The nitrogen is bonded additionally directly to two carbons	188	.....The -C(=X)- group is bonded directly to the thiazole ring
169	.....Chalcogen attached indirectly to the thiazole ring by nonionic bonding	189	.....Nitrogen attached indirectly to the thiazole ring by nonionic bonding
170	.....The chalcogen, X, is in a -C(=X)- group	190	.....Nitrogen attached directly to the thiazole ring by nonionic bonding
171	.....Nitrogen bonded directly to the -C(=X)- group	191	.....Plural nitrogens attached directly to the thiazole ring by nonionic bonding
172	.....Nitrogen attached directly to chalcogen by nonionic bonding	192	.....Nitrogen bonded directly to a -C(=X)- group, wherein X is chalcogen
173	.....Halogen attached directly or indirectly to the bicyclo ring system by nonionic bonding	193	.....Chalcogen attached indirectly to the thiazole ring by nonionic bonding
174	.....Sulfur double bonded or thiol bonded directly to ring carbon of the thiazole ring	194	.....The chalcogen, X, is in a -C(=X)- group
175	.....Process of forming the bicyclo ring system	195	.....The -C(=X)- group is bonded directly to the nitrogen
176	.....Aniline or alkyl derivative thereof utilized as starting material	196	.....Chalcogen or additional nitrogen bonded directly to the -C(=X)- group
177	.....Purification or recovery	197	.....Nitrogen bonded directly to chalcogen
178	.....Chalcogen or nitrogen attached directly to the other cyclo of the bicyclo ring system by nonionic bonding	198	.....Nitrogen attached indirectly to the thiazole ring by nonionic bonding
179	.....Chalcogen attached indirectly to the bicyclo ring system by nonionic bonding	199	.....The nitrogen is bonded additionally only to hydrogen
180	.....The chalcogen, X, is in a -C(=X)- group	200	.....Having -C(=X)-, wherein X is chalcogen, bonded directly to the thiazole ring
181	....Polycyclo heterocyclic ring system containing ring nitrogen	201	.....The -C(=X)- is part of a -C(=X)X- group, wherein the X's are the same or diverse chalcogens
182	....Chalcogen bonded directly to ring carbon of the thiazole ring		

202	....Plural double bonds between ring members of thiazole ring	221	....Chalcogen bonded directly at the 2-position of the oxazole ring
203	....Chalcogen attached indirectly to the thiazole ring by nonionic bonding	222	....Nitrogen bonded directly at the 2-position of the oxazole ring
204	.....The chalcogen, X, is in a -C(=X)- group	223	....At least four rings in the polycyclo ring system
205	....Nitrogen attached indirectly to the thiazole ring by nonionic bonding	224	....Carbocyclic ring bonded directly at the 2-position of the oxazole ring
206	...1,2-thiazoles (including hydrogenated)	225	...Chalcogen bonded directly to ring carbon of the oxazole ring
207	...Polycyclo ring system having the thiazole ring as one of the cyclos	226	....Plural chalcogens bonded directly to ring carbons of the oxazole ring
208	....Ring carbon is shared by three of the cyclos of the polycyclo ring system	227	....Chalcogens bonded directly at 2- and 5-positions of the oxazole ring
209	....Acyclic chalcogen bonded directly to ring carbon of the thiazole ring	228	....Chalcogen bonded directly at 5-position of the oxazole ring
210	.....At least three chalcogens bonded directly to the thiazole ring	229	....Chalcogen bonded directly at 2-position of the oxazole ring
211	.....Saccharin per se or salt thereof	230	....Nitrogen, halogen, or -C(=X)-, wherein X is chalcogen, attached directly to the oxazole ring by nonionic bonding
212	....Nitrogen attached directly to the thiazole ring by nonionic bonding	231	.....3-position substituent contains ethylenic or acetylenic unsaturation or nitrogen
213	...Chalcogen bonded directly to ring carbon of the thiazole ring	232	.....4- or 5-position substituent contains chalcogen
214	...Nitrogen or chalcogen attached indirectly to the thiazole ring by nonionic bonding	233	...Nitrogen bonded directly to ring carbon of the oxazole ring
215	...1,3-oxazoles (including hydrogenated)	234	....Additional ring attached directly to the nitrogen by nonionic bonding
216	....Spiro	235	...Plural double bonds between the ring members of the oxazole ring
217	...Polycyclo ring system having the oxazole ring as one of the cyclos	236	....Cyano or -C(=X)-, wherein X is chalcogen, attached directly or indirectly to the oxazole ring by nonionic bonding
218	....At least three ring hetero atoms in the polycyclo ring system	237	...One double bond between the ring members of the oxazole ring
219	....Plural polycyclo ring systems having the oxazole ring as one of the cyclos in each of the ring systems	238	....2-position substituent contains nitrogen, other than as nitro or nitroso
220	.....Plural oxazole-containing polycyclo ring systems each bonded directly to the same polycyclo ring system or the same hetero ring		

- 239 .....2-position is unsubstituted or hydrocarbyl substituted only
- 240 ...1,2-oxazoles (including hydrogenated)
- 241 ....Polycyclo ring system having the oxazole ring as one of the cyclos
- 242 .....At least three ring hetero atoms in the polycyclo ring system
- 243 ....Chalcogen bonded directly to ring carbon of the oxazole ring
- 244 .....Nitrogen bonded directly to ring carbon of the oxazole ring
- 245 ....Nitrogen bonded directly to ring carbon of the oxazole ring
- 246 .....Nitrogen bonded directly to the 3-position of the oxazole ring
- 247 ....Plural double bonds between ring members of the oxazole ring
- 248 .....Having -C(=X)-, wherein X is chalcogen, bonded directly to ring carbon of the oxazole ring by nonionic bonding
- 249 .....4-position substituent contains plural chalcogens, attached indirectly to the oxazole ring by nonionic bonding, none of which is bonded directly to phenyl
- 250 ...Tetrazoles (including hydrogenated)
- 251 ....Chalcogen or nitrogen attached directly to the tetrazole ring by nonionic bonding
- 252 ....Chalcogen attached indirectly to the tetrazole ring by nonionic bonding
- 253 .....The chalcogen, X, is in a -C(=X)- group
- 254 ....Nitrogen attached indirectly to the tetrazole ring by nonionic bonding
- 255 ...1,2,3-triazoles (including hydrogenated)
- 256 ....Polycyclo heterocyclic ring system containing ring oxygen
- 257 ....Polycyclo ring system having the triazole ring as one of the cyclos
- 258 .....Ring nitrogen is shared by two of the cyclos
- 259 .....Chalcogen attached directly to the polycyclo ring system by nonionic bonding
- 260 .....Chalcogen attached indirectly to the polycyclo ring system by nonionic bonding
- 261 .....The chalcogen, X, is in a -C(=X)- group
- 262.2 ...1,2,4-triazoles (including hydrogenated)
- 262.4 ....Polycyclo ring system having the triazole ring as one of the cyclos
- 262.6 ....Having -NH-C(=X)-NHH attached directly to the triazole ring by nonionic bonding (wherein X is chalcogen or =NH, and substitution may be made for hydrogen only)
- 262.8 ...Plural nitrogens attached to the triazole ring indirectly by acyclic nonionic bonding, two of which are bonded directly to the same acyclic carbon
- 263.2 ....Chalcogen bonded directly to ring carbon of the triazole ring
- 263.4 .....Plural chalcogen bonded directly to ring carbons of the triazole ring
- 263.6 .....The 1- and 2- positions of the triazole ring are unsubstituted, or are alkyl or cycloalkyl substituted only
- 263.8 ....Halogen or nitrogen attached directly to the triazole ring by nonionic bonding
- 264.2 .....Carbon bonded directly to the chalcogen
- 264.4 .....Nitrogen or additional chalcogen attached indirectly to the chalcogen by acyclic nonionic bonding
- 264.6 ....Benzene ring bonded directly to the 4-position of the triazole ring
- 264.8 ....Nitrogen attached directly to the triazole ring by nonionic bonding

- 265.2 .....Plural nitrogens attached directly to the triazole ring by nonionic bonding
- 265.4 .....Having -C(=X)-, wherein X is chalcogen, bonded directly to the nitrogen
- 265.6 .....The nitrogen is further bonded to hydrogen only
- 265.8 ....Benzene ring bonded directly to ring nitrogen of the triazole ring, and directly to the acyclic carbon of a benzoyl or benzyl group
- 266.2 ....Additional unsaturated hetero ring attached directly or indirectly to the triazole ring by nonionic bonding
- 266.4 .....The additional unsaturated hetero ring is one of the cyclos of a polycyclo ring system (except alkylenedioxyphenyl)
- 266.6 .....The additional unsaturated hetero ring and the triazole ring are attached to the same acyclic atom or to the same acyclic chain
- 266.8 ....Cyano or -C(=X)-, wherein X is chalcogen, bonded directly to the triazole ring
- 267.2 ....Nitrogen attached indirectly to the triazole ring by acyclic nonionic bonding
- 267.4 .....The nitrogen is double or triple bonded to carbon
- 267.6 .....Having -C(=X)-, wherein X is chalcogen, bonded directly to the nitrogen
- 267.8 ....Chalcogen attached indirectly to the triazole ring by acyclic nonionic bonding
- 268.2 .....The triazole ring and the chalcogen are bonded directly to the same acyclic carbon
- 268.4 .....Acyclic carbon bonded directly to triazole ring nitrogen is multiple bonded to an additional carbon
- 268.6 .....Plural chalcogens attached indirectly to the triazole ring by acyclic nonionic bonding
- 268.8 ....The triazole ring and a hetero ring whose ring members are carbon and chalcogen are bonded directly to the same acyclic carbon
- 269.2 ....Processes for forming the triazole ring
- 269.4 ....Benzene ring bonded directly to the triazole ring
- 300.1 ...1,3-diazoles (including hydrogenated)
- 300.4 ....Polycyclo ring system containing anthracene configured ring system having at least one double bond between ring members and having oxygen single bonded or any atom double bonded directly at the 9- or 10-positions (e.g., anthrone, anthraquinone, etc.)
- 300.7 ....Spiro
- 301.1 .....One of the two rings which form the spiro is part of a polycyclo ring system
- 301.4 .....Acyclic chalcogen bonded directly at the 2- and at the 4- or 5- positions of the 1,3-diazole ring [e.g., cyclohexanespiro-5`-(3`-hydroxymethyl) hydantoin, etc.]
- 301.7 ....Polycyclo ring system having the diazole ring as one the cyclos
- 302.1 .....Tricyclo ring system having the diazole ring as one the cyclos
- 302.4 .....The 1,3-diazole shares ring nitrogen with a five-membered ring having no additional hetero atoms (e.g., imidazo [2,1-a] isoindole, etc.)
- 302.7 .....Bicyclo ring system having the diazole ring as one of the cyclos
- 303.1 .....At least three ring hetero atoms in the bicyclo ring system (e.g., furo- imidazole, (1,2-a) imidazole, pyrazo (1,2-a) imidazolidine, etc.)
- 303.4 .....Four ring nitrogens in the bicyclo ring system (e.g., glycoluril, etc.)

- 303.7 .....The other cyclo is a five-membered hetero ring having one sulfur and four carbons (e.g., cis-tetrahydro-2-oxothieno [3,4-d]-imidazoline 4-valeric acid or biotin, etc.)
- 304.1 .....Having -C(=O)-HN-, wherein substitution may be made for H, attached directly or indirectly to the bicyclo ring system by acyclic nonionic bonding (e.g., biotin amide, biotinylglycine, etc.)
- 304.4 .....The other ring is a benzene ring
- 304.7 .....Additional hetero ring attached directly or indirectly to the diazole ring by nonionic bonding (e.g., methyl( 5-[2-(2-thienyl)-1,3-dioxolan -2-yl]-1H-benzimidazol-2-yl) carbamate, etc.)
- 305.1 .....The additional hetero ring is a cyclo in a polycyclo ring system (e.g., benzofuranyl-benzimidazole, etc.)
- 305.4 .....The additional polycyclo ring system contains a 1,3-diazole [e.g., bis (benzimidazol-2-yl) stilene, etc.]
- 305.7 .....The polycyclo ring systems are bonded to the same acyclic carbon atom or to the same acyclic carbon chain (e.g., di-[2-benzimidazolyl]-methane; di-[benzimidazolyl-(2)]-monohydroxyethylene, etc.)
- 306.1 .....The additional hetero ring contains nitrogen as the only ring hetero atom [e.g., 2-(2'-imidazolin-2'-yl)-benzimidazole; 1-p-chlorophenyl-3- pyrrolidin-1'-yl-propyl benzimidazolone, etc.]
- 306.4 .....Chalcogen bonded directly to ring carbon of the diazole ring
- 306.7 .....Plural chalcogens attached directly to the diazole ring by nonionic bonding
- 307.1 .....The chalcogen is sulfur
- 307.4 .....Nitrogen attached directly to the diazole ring by nonionic bonding
- 307.7 .....Chalcogen attached directly to diazole ring nitrogen by nonionic bonding
- 308.1 .....Having -C(=X)-, wherein X is chalcogen, bonded directly to the diazole ring
- 308.4 .....Acyclic nitrogen bonded directly to the -C(=X)- group
- 308.7 .....Having -C(=X)-X-, wherein the X's are the same or diverse chalcogens, attached indirectly to the diazole ring by acyclic nonionic bonding
- 309.1 .....Chalcogen bonded directly to the benzene ring of the bicyclo ring system
- 309.4 .....Having -C(=X)-, wherein X is chalcogen, bonded directly to the diazole ring
- 309.7 .....Nitrogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 310.1 .....Chalcogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 310.4 .....Halogen attached directly or indirectly to the diazole ring by acyclic nonionic bonding
- 310.7 .....Benzene ring bonded directly at the 2- position of the diazole ring
- 311.1 ...Additional hetero ring attached directly or indirectly to the diazole ring by nonionic bonding (e.g., 1,3-dioxolan-2-yl methyl-imidazole, etc.)
- 311.4 .....The additional hetero ring is a cyclo in a polycyclo ring system [e.g., 2-(1-isothiochromanyl)-2-imidazoline hydrochloride, etc.]
- 311.7 .....At least two ring hetero atoms in the polycyclo ring system

- 312.1 .....The additional polycyclo ring system is a bicyclo ring system having nitrogen as the only ring hetero atom [e.g., 5-(indolyl-3-methylene)-hydantoin, etc.]
- 312.4 .....The additional hetero ring is a diazole ring (including hydrogenated)
- 312.7 .....Plural 1,3-diazoles
- 313.1 .....Additional diverse hetero ring attached directly or indirectly to a diazole ring by nonionic bonding
- 313.4 .....The diazole rings are bonded directly to each other
- 313.7 .....Ring nitrogens of two diazole rings attached directly to the same atom or chain, which chain may include a ring, by nonionic bonding
- 314.1 .....Acyclic chalcogen bonded directly at the 2- and at the 4- or 5- positions of each of the two diazole rings (e.g., N, N` methylene bis - hydantoin, etc.)
- 314.4 .....Two diazole rings are bonded directly to the same carbon atom or carbon chain, which chain may include a ring
- 314.7 .....The additional hetero ring contains nitrogen as the only ring hetero atom [e.g., N-(cyclopentylcarbonyl-L-histidyl)-pyrrolidine, etc.]
- 315.1 .....The additional hetero ring contains sulfur as the only ring hetero atom [e.g., 5-(2-thienyl) hydantoin, etc.]
- 315.4 .....The additional hetero ring is a five-membered ring having oxygen and four carbons (e.g., pilocarpine; 2-[5-(3,4-dimethoxyphenyl)-2-furyl]imidazole hydrochloride, etc.)
- 315.7 .....Acyclic chalcogen bonded directly to ring carbon of the 1,3-diazole ring
- 316.1 .....Plural acyclic chalcogens bonded directly at the 2- and at the 4- or 5- positions of the 1,3-diazole ring [e.g., N-(5-nitro-2-furfuryliden)-1-amino-hydantoin, etc.]
- 316.4 ....Chalcogen bonded directly to ring carbon of the diazole ring (e.g., N-vinyl-N, N`ethylene urea, etc.)
- 316.7 .....Additional chalcogen attached directly to ring nitrogen of the diazole ring by nonionic bonding
- 317.1 .....Plural chalcogens bonded directly to ring carbons of the diazole ring
- 317.5 .....Three chalcogens bonded directly to ring carbons of the diazole ring
- 318.1 .....Nitrogen attached directly to the diazole ring by nonionic bonding [e.g., (2,5-dioxo-4-imidazolidinyl)urea or allantoin, etc.]
- 318.5 .....Having -C(=X)-, wherein X is chalcogen, bonded directly to the diazole ring
- 319.1 .....Chalcogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 319.5 .....The chalcogen, X, is in a -C(=X)- group
- 320.1 .....Nitrogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 320.5 .....Halogen attached directly or indirectly to the diazole ring by acyclic nonionic bonding
- 321.1 .....Benzene ring bonded directly to the diazole ring
- 321.5 .....Nitrogen attached directly to the diazole ring by nonionic bonding
- 322.1 .....The nitrogen is attached directly to ring nitrogen of the diazole ring by nonionic bonding (e.g., dinitroethylene urea, etc.)
- 322.5 .....Having -C(=X)-, wherein X is chalcogen, bonded directly to the diazole ring
- 323.1 .....Acyclic nitrogen bonded directly to the -C(=X)- group
- 323.5 .....Chalcogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 324.1 .....The chalcogen, X, is in a -C(=X)- group



- 324.5 .....Nitrogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 325.1 .....The chalcogen is sulfur or selenium (e.g., 2-mercaptoimidazoline, ethylenethiourea, etc.)
- 325.5 .....Benzene ring bonded directly to the diazole ring
- 326.1 .....The diazole ring is further unsubstituted (e.g., cyclic ethylene urea, etc.)
- 326.5 ....Nitrogen attached directly to the diazole ring by nonionic bonding
- 327.1 .....The nitrogen is part of a nitro group (i.e., -NO ), (e.g., 5-nitroimidazole, etc.)
- 327.5 .....The nitro group is bonded directly at the 2-position of the diazole ring
- 328.1 .....Having -C(=X)-, wherein X is chalcogen, bonded directly to the diazole ring
- 328.5 .....Nitrogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 329.1 .....The nitrogen is multiply bonded to carbon
- 329.5 .....Benzene ring bonded directly at the 2-position of the diazole ring
- 330.1 .....Chalcogen, not part of a nitro group, attached indirectly to the diazole ring by acyclic nonionic bonding
- 330.5 .....The chalcogen is sulfur
- 331.1 .....Chalcogen or the nitrogen attached directly to diazole ring nitrogen by nonionic bonding
- 331.5 .....The nitrogen is bonded directly at the 2-position of the diazole ring
- 332.1 .....Having -C(=X)-, wherein X is chalcogen, bonded directly to the diazole ring
- 332.5 .....Chalcogen, additional nitrogen, or -C(=X)-, wherein X is chalcogen or nitrogen, attached directly to the nitrogen by nonionic bonding
- 333.1 .....Benzene ring bonded directly to the nitrogen
- 333.5 ....Having -C(=X)-, wherein X is chalcogen, bonded directly to the diazole ring
- 334.1 .....The -C(=X)- is bonded directly to ring nitrogen of the diazole ring
- 334.5 .....The -C(=X)- is part of a -C(=X)X- group, wherein the X's are the same or diverse chalcogens (e.g., imidazole-4,5-dicarboxylic acid, etc.)
- 335.1 ....Two double bonds between ring members of the diazole ring (i.e., imidazole)
- 335.5 .....Nitrogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 336.1 .....The nitrogen is multiply bonded to carbon
- 336.5 .....Having a -C=N group bonded directly to the nitrogen (e.g., N-cyano-N'-methyl-N--{2-(4-methyl-5-imidazolyl)-methylthio]-ethyl}guanidine, etc.)
- 337.1 .....The nitrogen is part of a -C=N group which is bonded directly to the diazole ring (e.g., 4,5-dicyanoimidazole, etc.)
- 338.1 .....Having -C(=X)-, wherein X is chalcogen, bonded directly to the nitrogen
- 338.5 .....The chalcogen is sulfur or sulfur attached indirectly to the -C(=X)- group by acyclic nonionic bonding
- 339.1 .....The nitrogen and -C(=X)X-, wherein X's are the same or diverse chalcogens, are bonded directly to the same acyclic carbon atom (e.g., -amino-4(5)-imidazole propionic acid or histidine, etc.)
- 339.5 .....Halogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 340.1 .....Chalcogen attached indirectly to the nitrogen by acyclic nonionic bonding
- 341.1 .....Chalcogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 341.5 .....The chalcogen, X, is in a -C(=X)- group
- 342.1 .....The chalcogen is sulfur

- 342.5 .....Benzene ring or halogen attached directly to the diazole ring by nonionic bonding (e.g., 1-hydroxyethyl-4,5-diphenyl-imidazole; 1-ethyloxymethyl-2, 4,5-trichloro-imidazole, etc.)
- 343.1 .....Halogen attached directly or indirectly to the diazole ring by acyclic nonionic bonding
- 343.5 .....Benzene ring bonded directly to the diazole ring
- 344.1 .....The diazole ring and two benzene rings are bonded directly to the same acyclic carbon
- 345.1 .....Cycloaliphatic ring bonded directly to the diazole ring
- 346.1 .....Benzene ring attached indirectly to the diazole ring by acyclic nonionic bonding
- 347.1 ....One double bond between ring members of the diazole ring (i.e., imidazoline)
- 348.1 .....Nitrogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 349.1 .....Chalcogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 350.1 .....Chalcogen attached indirectly to the diazole ring by acyclic nonionic bonding (e.g., hydroxyalkyl glyoxalidine, etc.)
- 351.1 .....The chalcogen is sulfur
- 352.1 .....The chalcogen, X, is in a -C(=X)X- group, wherein X's are the same or diverse chalcogens
- 353.1 .....Benzene ring bonded directly to the chalcogen [e.g., 2-(3-aminophenoxymethyl)imidazoline, etc.]
- 354.1 .....Benzene ring bonded directly to the diazole ring
- 355.1 .....Benzene ring and the diazole ring are bonded to the same acyclic carbon atom or carbon chain
- 356.1 ...1,2-diazoles (including hydrogenated)
- 356.5 ....Polycyclo ring system containing anthracene configured ring system having at least one double bond between ring members and having oxygen single bonded or any atom double bonded directly at the 9- or 10-positions (e.g., anthrone, anthraquinone, etc.)
- 357.1 .....Additional polycyclo ring system having at least three cyclos attached directly or indirectly to the anthrone or anthraquinone by nonionic bonding
- 357.5 ....Spiro
- 358.1 ....Polycyclo ring system having the diazole ring as one of the cyclos
- 358.5 .....Tetracyclo ring system having the diazole ring as one of the cyclos
- 359.1 .....Tricyclo ring system having the diazole ring as one of the cyclos
- 359.5 .....At least three ring hetero atoms in the tricyclo ring system
- 360.1 .....Bicyclo ring system having the diazole ring as one of the cyclos (e.g., 2, 4-dichloro-5-nitrophenyl-4,5,6,7-tetrahydro-2H-indazole, etc.)
- 360.5 .....At least three ring hetero atoms in the bicyclo ring system
- 361.1 .....The other ring is a benzene ring
- 361.5 .....Chalcogen bonded directly to ring carbon of the diazole ring
- 362.1 .....Nitrogen attached directly to the diazole ring by nonionic bonding
- 362.5 .....Having chalcogen or nitrogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 363.1 .....Chalcogen bonded directly to ring carbon of the diazole ring
- 364.1 ....Additional hetero ring attached directly or indirectly to the diazole ring by nonionic bonding

- 364.4 .....The additional hetero ring is a cyclo in a polycyclo ring system
- 364.7 .....The polycyclo ring system contains nitrogen as the only ring hetero atom
- 365.1 .....Plural 1,2-diazoles (including hydrogenated)
- 365.4 .....Two diazole rings are bonded directly to each other, to the same acyclic carbon atom or to the same acyclic carbon chain
- 365.7 .....The additional hetero ring contains chalcogen as the only ring hetero atom
- 366.1 ....Chalcogen bonded directly to ring carbon of the diazole ring
- 366.4 .....Plural chalcogens bonded directly to diazole ring carbons
- 366.7 .....Nitrogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 367.1 .....Chalcogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 367.4 .....Nitrogen attached directly to the diazole ring by nonionic bonding
- 367.7 .....The nitrogen is multiply bonded to acyclic carbon or is bonded to nitrogen of the diazole ring
- 368.1 .....Chalcogen attached directly to the nitrogen by nonionic bonding [e.g., 5- (2-carbethoxyphenoxy)-1,3-dimethyl-4-nitropyrazole, etc.]
- 368.4 .....Having -C(=X)-, wherein X is chalcogen, bonded directly to the nitrogen
- 368.7 .....The nitrogen and the chalcogen are directly bonded to non-adjacent carbons of the diazole ring (e.g., pyrazolone imide or imino pyrazolone, etc.)
- 369.1 .....Chalcogen attached indirectly to the nitrogen by acyclic nonionic bonding
- 369.4 .....Having -C(=X)-, wherein X is chalcogen bonded directly to the diazole ring
- 369.7 .....Acyclic nitrogen or chalcogen bonded directly to the -C(=X)- group
- 370.1 .....Nitrogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 370.4 .....Chalcogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 370.7 .....The chalcogen is bonded directly at the 4-position of the diazole ring
- 371.1 .....Benzene ring is bonded directly to ring nitrogen of the diazole ring (e.g., 1-phenyl-3-methyl-5-pyrazolone; antipyrine, etc.)
- 371.4 ....Nitrogen attached directly to the diazole ring by nonionic bonding
- 371.7 .....Nitrogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 372.1 .....Chalcogen attached directly to the nitrogen by nonionic bonding [e.g., N-(2-hydroxyethyl)-4-nitropyrazole, etc.]
- 372.5 .....Chalcogen attached indirectly to the diazole ring by acyclic nonionic bonding [e.g., 1-(2-hydroxyethyl)-3-amino-4(para-chlorophenyl)-pyrazole, etc.]
- 373.1 ....Two double bonds between ring members of the diazole ring (i.e., pyrazole)
- 374.1 .....Having -C(=X)-, wherein X is chalcogen bonded directly to the diazole ring
- 375.1 ....Nitrogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 376.1 .....Chalcogen attached indirectly to the diazole ring by acyclic nonionic bonding
- 377.1 .....Benzene ring bonded directly to the diazole ring
- 379.1 ....One double bond between ring members of the diazole ring (i.e., pyrazoline)
- 379.4 .....Chalcogen or nitrogen attached indirectly to the diazole ring by acyclic nonionic bonding

379.7	.....Plural benzene rings bonded directly to the diazole ring	417	....The polycyclo ring system has at least six cyclos, and has either a ring carbon that is shared by three of the cyclos or has a ring chalcogen
400	..Hetero ring is five-membered consisting of one nitrogen and four carbons (e.g., halopyrrolidines, etc.)	418	...Pentacyclo ring system having the five-membered hetero ring as one of the cyclos
401	...With preservative or stabilizer	419	.....Two of the cyclos share at least three ring members, or a ring carbon is shared by three of the cyclos (e.g., bridged, peri-fused, etc.)
402	..Heavy metal or aluminum containing	420	...Tetracyclo ring system having the five-membered hetero ring as one of the cyclos
403	....The metal is bonded directly to chalcogen, which chalcogen is attached directly or indirectly to the five-membered hetero ring by nonionic bonding pyrazole ring carbon	421	.....Plural ring hetero atoms in the tetracyclo ring system
404	....Plural chalcogens bonded directly to ring carbons of the five-membered hetero ring (e.g., cyclic imides, etc.)	422	.....Three-membered nitrogen containing hetero ring is cyclo in the tetracyclo ring system (e.g., mitomycin C, etc.)
405	...Boron containing	423	.....Plural chalcogens bonded directly to ring carbons of the five-membered hetero ring (e.g., cyclic imides, etc.)
406	...Silicon containing	424	.....Two of the cyclos share at least three ring members, or a ring carbon is shared by three of the cyclos (e.g., bridged, peri-fused, etc.)
407	...Spiro	425	.....Benzene ring is cyclo in the tetracyclo ring system
408	....The spiro includes the five-membered hetero ring	426	.....The five-membered hetero ring shares ring members with one other cyclo only
409	.....Both rings which form the spiro are hetero rings	427	...Tricyclo ring system having the five-membered hetero ring as one of the cyclos
410	.....Acyclic chalcogen attached directly to the five-membered nitrogen containing spiro hetero ring by nonionic bonding	428	....Ring nitrogen is shared by two of the cyclos
411	.....Polycyclo ring system having one of the two rings which form the spiro as one of the cyclos	429	.....Plural ring hetero atoms in the tricyclo ring system
412	...Phosphorus attached directly to the five-membered hetero ring by nonionic bonding	430	.....Ring chalcogen in the tricyclo ring system
413	...Phosphorus attached indirectly to the five-membered hetero ring by nonionic bonding	431	.....Chalcogen bonded directly to ring carbon of the five-membered hetero ring (e.g., cyclic imides, etc.)
414	....Polycyclo ring system having the five-membered hetero ring as one of the cyclos	432	.....Pyrano(3,4-b)indoles or thiopyrano(3,4-b) indoles (including hydrogenated)
415	.....Plural chalcogens bonded directly to ring carbons of the five-membered hetero ring		
416	...Polycyclo ring system having the five-membered hetero ring as one of the cyclos		

- 433 .....The tricyclo ring system consists of a benzene ring which shares ring carbons with two nitrogen containing hetero rings (e.g., pyromellitic diimide, etc.)
- 434 .....Two of the cyclos share at least three ring members (i.e., bridged)
- 435 .....Plural chalcogens bonded directly to ring carbons of the five-membered hetero ring (e.g., cyclic imides, etc.)
- 436 .....A ring carbon is shared by three of the cyclos (e.g., peri-fused, etc.)
- 437 .....Chalcogen bonded directly to ring carbon of the five-membered hetero ring (e.g., naphthostyryl, etc.)
- 438 .....Benzene ring, which is not a cyclo in the tricyclo ring system, bonded directly to ring carbon of the five-membered hetero ring
- 439 .....The five-membered hetero ring shares ring carbons with two carbocyclic rings (e.g., tetrahydrocarbazoles, etc.)
- 440 .....The five-membered hetero ring shares ring carbons with two benzene rings (i.e., carbazoles)
- 441 .....Having  $-C(=X)-$ , wherein X is chalcogen, bonded directly to the tricyclo ring system (e.g., carbazole-3-carboxylic acid, etc.)
- 442 .....One of the benzene rings and an additional carbocyclic ring bonded directly to the same acyclic nitrogen
- 443 .....Azido or sulfonyl attached directly to the tricyclo ring system by nonionic bonding (e.g., carbazole sulfonic acid, etc.)
- 444 .....Chalcogen or nitrogen attached indirectly to the tricyclo ring system by acyclic nonionic bonding
- 445 .....The tricyclo ring system is unsubstituted or is hydrocarbyl substituted only (e.g., N-vinyl carbazole, etc.)
- 446 .....Carbazole per se or alkyl substituted only
- 447 .....Processes of forming by cyclization or alkylation
- 448 .....Having  $-C(=X)-$ , wherein X is chalcogen, bonded directly to ring carbon of the tricyclo ring system (e.g., 1, 2, 3, 4-tetrahydrocarbazole-3-carboxylic acid, etc.)
- 449 .....Chalcogen or nitrogen attached indirectly to ring nitrogen of the five membered hetero ring by acyclic nonionic bonding
- 450 .....Chalcogen bonded directly to ring carbon of the five-membered hetero ring (e.g., indigoid dyes, etc.)
- 451 .....Plural chalcogens bonded directly to ring carbons of the five-membered hetero ring (e.g., cyclic imides, naphthisatins, etc.)
- 452 .....Bicyclo ring system having the five-membered hetero ring as one of the cyclos (e.g., octahydroindoles, etc.)
- 453 .....Plural ring hetero atoms in the bicyclo ring system, or ring nitrogen is shared by the two cyclos of the bicyclo ring system
- 454 .....Additional polycyclo heterocyclic ring system attached directly or indirectly to the bicyclo ring system by nonionic bonding
- 455 .....The additional polycyclo ring system includes a five-membered nitrogen containing hetero ring
- 456 .....Lactone ring containing (e.g., 3,3-bisindolyl phthalides, etc.)
- 457 .....Ring carbon of one of the five-membered hetero rings is bonded directly to ring carbon of the other (e.g., indigo dyes, etc.)
- 458 .....By a single bond (e.g., leuco indigo, etc.)

- 459 .....Halogen attached directly or indirectly to the bicyclo ring system by nonionic bonding (e.g., dibromoindigo, etc.)
- 460 .....Ring carbon of each of the two five-membered hetero rings is bonded directly to chalcogen or nitrogen (e.g., both rings may be bonded to the same nitrogen atom or to different nitrogen atoms, etc.)
- 461 .....Plural chalcogens bonded directly to ring carbons of each of the two five membered hetero rings (e.g., bisphthalimides, etc.)
- 462 .....The ring nitrogen of each of the two five-membered hetero rings is bonded directly to the same atom or chain, which chain may include a ring (e.g., N,N'-ethylene-bisphthalimide, etc.)
- 463 .....The additional polycyclo heterocyclic ring system has a lactone ring as one of the cyclos
- 464 .....Ring carbon of the five-membered hetero ring is bonded directly to a ring carbon of the hetero ring which is a cyclo in the additional polycyclo heterocyclic ring system (e.g., indigoid dyes, etc.)
- 465 .....Additional hetero ring, attached directly or indirectly to the bicyclo ring system by nonionic bonding
- 466 .....The additional hetero ring is bonded directly to a ring carbon of the bicyclo ring system
- 467 .....Substituent on ring carbon of the bicyclo ring system contains the additional hetero ring
- 468 .....The additional hetero ring and the bicyclo ring system are attached directly to the same acyclic carbon or acyclic carbon chain
- 469 .....The bicyclo ring system consists of the five-membered hetero ring and a benzene ring (e.g., indole, etc.)
- 470 .....The ring nitrogen is bonded directly to two ring carbons of the same cyclo which carbons are members of one cyclo only (i.e., isoindoles or isoindolenines)
- 471 .....Nitrogen bonded directly to ring carbon of the five-membered hetero ring
- 472 .....Chalcogen bonded directly to ring carbon of the five-membered hetero ring (e.g., phthalimidines, etc.)
- 473 .....Plural chalcogens bonded directly to ring carbons of the five-membered hetero ring (e.g., phthalimides, etc.)
- 474 .....Polycyclo carbocyclic ring system having at least three cyclos
- 475 .....Chalcogen or nitrogen attached directly to the ring nitrogen of the five membered hetero ring by nonionic bonding
- 476 .....Benzene ring bonded directly to the ring nitrogen of the five-membered hetero
- 477 .....Nitrogen attached indirectly to the ring nitrogen of the five-membered hetero ring by acyclic nonionic bonding
- 478 .....Chalcogen attached indirectly to the ring nitrogen of the five-membered hetero ring by acyclic nonionic bonding
- 479 .....The chalcogen, X, is in a -C(=X)- group (e.g., beta - phthalimidopropionaldehyde, etc.)
- 480 .....The ring nitrogen of the five-membered hetero ring is unsubstituted or hydrocarbyl substituted only
- 481 .....Chalcogen or nitrogen attached indirectly to ring carbon of the bicyclo ring system by acyclic nonionic bonding

- 482 .....The five-membered hetero ring contains one double bond only (i.e., isoindolines)
- 483 .....Nitrogen attached directly to the five-membered hetero ring by nonionic bonding (e.g., 2-amino indoles, etc.)
- 484 .....Chalcogen bonded directly to ring carbon of the five-membered hetero ring (e.g., 3-indolols, etc.)
- 485 .....Plural chalcogens bonded directly to ring carbons of the five-membered hetero ring (e.g., isatins, etc.)
- 486 .....The chalcogen is bonded directly to a ring carbon of the five-membered hetero ring which is adjacent to the ring nitrogen (e.g., 2-indolinones, etc.)
- 487 .....Two benzene rings bonded directly to the same ring carbon of the five membered hetero ring
- 488 .....Polycyclo carbocyclic ring system bonded directly to a ring carbon of the five-membered hetero ring (e.g., indol-alpha-naphtholindigo, etc.)
- 489 .....Process of forming the bicyclo ring system directly from reactant which contains acyclic nitrogen bonded directly to a benzene ring (e.g., indoxyl from phenylglycine, etc.)
- 490 .....The five-membered hetero ring contains one double bond only (i.e., indolines)
- 491 .....Chalcogen or nitrogen attached indirectly to the five-membered hetero ring by acyclic nonionic bonding
- 492 .....Having  $-C(=X)-$ , wherein X is chalcogen, bonded directly to ring carbon of the five-membered hetero ring (e.g., indole-2-carboxylic acids, etc.)
- 493 .....Hydrogen or additional carbon bonded directly to the  $-C(=X)-$  group (e.g., aldehydes, ketones, etc.)
- 494 .....Having  $-C(=X)-$ , wherein X is chalcogen, attached indirectly to ring carbon of the five-membered hetero ring by an acyclic carbon or acyclic carbon chain (e.g., indole-3-acetic acid, etc.)
- 495 .....Acyclic nitrogen bonded directly to the acyclic carbon or acyclic carbon chain
- 496 .....The acyclic carbon or acyclic carbon chain is further unsubstituted or alkyl substituted only (e.g., tryptophane, etc.)
- 497 .....Processes
- 498 .....Racemization or optical resolution
- 499 .....Preparing from hydantoins or proteins
- 500 .....Having  $-C(=X)-$ , wherein X is chalcogen, bonded directly to ring nitrogen of the five-membered hetero ring (e.g., indomethacin, etc.)
- 501 .....Processes
- 502 .....Processes
- 503 .....Nitrogen attached indirectly to ring carbon of the bicyclo ring system by acyclic nonionic bonding
- 504 .....Nitrogen attached indirectly to ring carbon of the five-membered hetero ring by acyclic nonionic bonding (e.g., tryptamine, etc.)
- 505 .....The nitrogen is double or triple bonded directly to carbon
- 506 .....Benzene ring bonded directly or attached indirectly by an acyclic carbon or an acyclic carbon chain to ring carbon of the five-membered hetero ring
- 507 .....Chalcogen or additional nitrogen attached indirectly to ring carbon of the five-membered hetero ring by acyclic nonionic bonding
- 508 .....Processes of forming the bicyclo ring system by cyclization (e.g., forming indole from o-ethyl aniline, etc.)

- 509 .....Chalcogen attached indirectly to the bicyclo ring system by acyclic nonionic bonding
- 510 .....The chalcogen, X, is in a -C(=X)- group
- 511 .....Benzene ring bonded directly or attached indirectly by an acyclic carbon or an acyclic carbon chain to ring carbon of the five-membered hetero ring
- 512 .....Chalcogen bonded directly to ring carbon of the five-membered hetero ring (e.g., adrenochrome, etc.)
- 513 .....Plural chalcogens bonded directly to ring carbons of the five-membered hetero ring (e.g., imides, etc.)
- 514 .....Chalcogen or nitrogen attached directly to ring nitrogen of the five membered hetero ring by nonionic bonding
- 515 .....The ring nitrogen is bonded directly to two ring carbons of the same cyclo which carbons are members of one cyclo only (e.g., cyclopenta(c)pyrroles, etc.)
- 516 .....Two double bonds between ring members of the five-membered hetero ring (e.g., 4,5,6,7-tetrahydroindoles, etc.)
- 517 ...Additional hetero ring, which is attached directly or indirectly to the five-membered hetero ring by nonionic bonding
- 518 ...The additional hetero ring also contains nitrogen
- 519 .....Ring carbon of each of the two nitrogen containing hetero rings is bonded directly to chalcogen (e.g., both rings may be bonded to the same oxygen atom or to different oxygen atoms, etc.)
- 520 .....Plural chalcogens bonded directly to ring carbons of each of the two nitrogen containing hetero rings (e.g., bis-succinimides, etc.)
- 521 .....Double bond between ring carbons in each of the two nitrogen containing hetero rings (e.g., bis-maleimides, etc.)
- 522 .....Processes
- 523 ....Ring nitrogens of the two nitrogen containing hetero rings are bonded directly to the same atom or chain, which chain may include a ring
- 524 .....The atom is carbon or the chain consists of carbons
- 525 ...Polycyclo ring system which includes ring chalcogen
- 526 ....Plural ring chalcogens in the polycyclo ring sytem (e.g., methylenedioxyphenyl containing, etc.)
- 527 ...Sulfur containing hetero ring
- 528 ...Polycyclo carbocyclic ring system having at least three cyclos
- 529 ...Attached directly to the five-membered hetero ring
- 530 ..Having -C(=X)-, wherein X is chalcogen, bonded directly to the five membered hetero ring (e.g., pyrrole carbonyl halides, pyrrole carboxaldehyde, etc.)
- 531 ...The -C(=X)- is part of a -C(=X)X- group, wherein the X's are the same or diverse chalcogens (e.g., pyrrole-3-carboxylic acid, etc.)
- 532 .....And is bonded directly to a ring carbon which is adjacent to the ring nitrogen of the five-membered hetero ring (e.g., 4-hydroxy proline, etc.)
- 533 .....Additional -C(=X) bonded directly to the five-membered hetero ring (e.g., N n-butryl-L-proline, etc.)
- 534 .....Chalcogen bonded directly to the other ring carbon which is adjacent to the ring nitrogen of the five-membered hetero ring (e.g., 2-pyrrolidone-5 carboxylic acid, etc.)



- 535 .....The five-membered hetero ring is further unsubstituted or alkyl substituted only (e.g., proline, etc.)
- 536 .....Additional -C(=X)- bonded directly to the five-membered hetero ring (e.g., pyrrole-3,4-dicarboxylic acid esters, etc.)
- 537 ....Acyclic nitrogen bonded directly to the -C(=X)- (e.g., 4,5-dihalopyrrole -2 carboxamides, etc.)
- 538 .....The -C(=X)- is bonded directly to the ring nitrogen of the five-membered hetero ring (e.g., 1-pyrrolidine carboxanilides, etc.)
- 539 ....Carbocyclic ring bonded directly to the -C(=X)- (e.g., 3-benzoyl pyrrolidine, etc.)
- 540 ....Acyclic carbon bonded directly to the -C(=X)- (e.g., N-oleoylpyrrolidine, etc.)
- 541 ...Chalcogen attached directly to the five-membered hetero ring by nonionic bonding (e.g., 3-pyrrolidinols, etc.)
- 542 ....Chalcogen attached directly to ring nitrogen of the five-membered hetero ring by nonionic bonding (e.g., pyrrolidine-N-oxides, etc.)
- 543 ....Chalcogen bonded directly to a ring carbon of the five-membered hetero ring which is adjacent to the ring nitrogen (e.g., 2-pyrrolidones, etc.)
- 544 .....And chalcogen bonded directly to a ring carbon of the five membered hetero ring which is not adjacent to the ring nitrogen (e.g., 2,4 pyrrolidinediones, etc.)
- 545 .....And chalcogen bonded directly to the other ring carbon of the five-membered hetero ring which is adjacent to the ring nitrogen (e.g., succinimide, etc.)
- 546 .....Nitrogen attached directly or indirectly to the five-membered hetero ring by acyclic nonionic bonding
- 547 .....Chalcogen attached indirectly to the five-membered hetero ring by acyclic nonionic bonding
- 548 .....Carbon to carbon unsaturation between ring members of the five-membered hetero ring (e.g., maleimide, etc.)
- 549 .....Benzene ring bonded directly to ring nitrogen of the five-membered hetero ring (e.g., N-phenylmaleimide, etc.)
- 550 ....Nitrogen attached directly or indirectly to the five-membered hetero ring by acyclic nonionic bonding
- 551 ....Chalcogen attached indirectly to the five-membered hetero ring by acyclic nonionic bonding
- 552 ....Processes of forming 2-pyrrolidone which is unsubstituted or alkyl or alkenyl substituted only
- 553 .....Directly from a cyano containing compound (e.g., from succinonitrile, etc.)
- 554 .....Directly from a -COO- containing compound (e.g., from methyl acrylate, etc.)
- 555 ....Purification or recovery of 2-pyrrolidone which is unsubstituted or alkyl substituted only
- 556 ...Chalcogen attached indirectly to the five-membered hetero ring by acyclic nonionic bonding (e.g., 4-hydroxy -3-pyrrolidinemethanol, etc.)
- 557 ...Nitrogen attached directly to the five-membered hetero ring by nonionic bonding
- 558 ...The nitrogen is bonded directly to a ring carbon which is adjacent to the ring nitrogen of the five-membered hetero ring
- 559 ....Carbocyclic ring bonded directly to the nitrogen
- 560 ...Two double bonds between ring members of the five-membered hetero ring

- 561 ...Nitrogen attached indirectly to the five-membered hetero ring by acyclic nonionic bonding
- 562 ...Chalcogen attached indirectly to the five-membered hetero ring by acyclic nonionic bonding
- 563 ...Benzene ring bonded directly to ring nitrogen of the five-membered hetero ring
- 564 ...The five-membered hetero ring is unsubstituted or alkyl substituted only (e.g., pyrrole, etc.)
- 565 ...One double bond between ring members of the five-membered hetero ring (i.e., pyrrolines)
- 566 ...Nitrogen attached indirectly to the five-membered hetero ring by acyclic nonionic bonding
- 567 ...The nitrogen is bonded directly to  $-C(=X)-$ , wherein X is chalcogen (e.g., 2 benzamidomethyl - pyrrolidines, etc.)
- 568 ...Hydrogen or acyclic carbon bonded directly to the  $-C(=X)-$  (e.g., 2 pyrrolidine acrylamide, etc.)
- 569 ...The nitrogen is in a substituent attached to the ring nitrogen of the five membered hetero ring
- 570 ...Chalcogen attached indirectly to the five-membered hetero ring by acyclic nonionic bonding
- 571 ...The chalcogen, X, is in a  $-C(=X)-$  group (e.g., 1-phenyl - 2-pyrrolidino hexanone-1, etc.)
- 572 ...The  $-C(=X)-$  is part of a  $-C(=X)X-$  group wherein the X's are the same or diverse chalcogens (e.g., 3-pyrrolidinemethanol propionates, etc.)
- 573 .....The  $-C(=X)X-$  group is in a substituent attached to the ring nitrogen of the five-membered hetero ring (e.g., beta-pyrrolidyl ethyl ester of benzoic acid, etc.)
- 574 ...The chalcogen is in a substituent attached to the ring nitrogen of the five membered hetero ring
- 575 ....Carbocyclic ring bonded directly to the chalcogen
- 576 .....The substituent on the ring nitrogen of the five-membered hetero ring contains a bicyclo carbocyclic ring system
- 577 ...Benzene ring bonded directly to the five-membered hetero ring
- 578 ...Benzene ring in a substituent attached to the ring nitrogen of the five membered hetero ring by nonionic bonding
- 579 ...The five-membered hetero ring is unsubstituted or is alkyl substituted only (e.g., pyrrolidine, etc.)
- 950 ..The hetero ring contains four members including nitrogen and carbon
- 951 ...Plural hetero atoms in the hetero ring
- 952 ...Chalcogen bonded directly to ring carbon of the hetero ring
- 953 ...Nitrogen or  $-C(=X)-$ , wherein X is chalcogen, bonded directly to the hetero ring
- 954 ..Hetero ring is three-membered including nitrogen and carbon
- 955 ...Heavy metal, boron or silicon containing
- 956 ...Phosphorus attached directly or indirectly to the hetero ring by nonionic bonding
- 957 ....Plural phosphori
- 958 ...Spiro
- 959 ...Plural hetero atoms in the hetero ring
- 960 ....Plural nitrogens in the hetero ring
- 961 ...Polycyclo ring system having the hetero ring as one of the cyclos
- 962 ...Additional hetero ring containing
- 963 ....Plural three-membered nitrogen containing hetero rings bonded directly to the same ring

- 964     ...Having -C(=X)-, wherein X is  
          chalcogen, in chain between  
          the hetero rings
- 965     ...Chalcogen, nitrogen or halogen  
          attached directly to the  
          hetero ring by nonionic  
          bonding
- 966     ...Having -C(=X)-, wherein X is  
          chalcogen, bonded directly to  
          the hetero ring
- 967     ...Nitrogen, other than as nitro  
          or nitroso, attached  
          indirectly to the hetero ring  
          by nonionic bonding
- 968     ...Chalcogen attached indirectly  
          to the hetero ring by nonionic  
          bonding
- 969     ...The three-membered hetero ring  
          is unsubstituted or alkyl  
          substituted only

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