

This Class 562 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.

		8	.Phosphorus acids or salts thereof (i.e., compounds having -XH, wherein X is chalcogen, attached directly to phosphorus by nonionic bonding and wherein the hydrogen may be replaced by a substituted or unsubstituted ammonium or by a group IA or IIA light metal)
	ORGANIC COMPOUNDS (CLASS 532, SUBCLASS 1)	9	..Sulfur attached directly to the phosphorus by nonionic bonding
1	.Persulphonic acids or salts thereof (i.e., compounds having the -S(=O)(=O) O-OH group, wherein the hydrogen may be replaced by a group IA or IIA light metal, or by substituted or unsubstituted ammonium)	10	..Nitrogen attached directly to the phosphorus by nonionic bonding
2	.Percarboxylic acids or salts thereof (i.e., compounds having the -C(=O)-O OH group, wherein the hydrogen may be replaced by a group IA or IIA light metal, or by substituted or unsubstituted ammonium)	11	..Nitrogen attached indirectly to the phosphorus by nonionic bonding
3	..With preservative or stabilizer	12	...Plural phosphori attached indirectly to each other by nonionic bonding
4	..Formation of the -C(=O)-O-OH group, or of a salt thereof (e.g., from acid halides or anhydrides, neutralization; etc)	13	...Plural phosphori bonded directly to the same carbon
5	...Aldehyde or percarboxylic acid ester reactant	14	...Additional nitrogen attached indirectly to the phosphorus by nonionic bonding
6	...Carboxylic acid or carboxylic acid salt reactant	15	...The nitrogen is bonded directly to -C(=X)-, wherein X is chalcogen
7	.Boron acids or salts thereof (i.e., compounds having -XH, wherein X is chalcogen, attached directly to boron by nonionic bonding and wherein the hydrogen may be replaced by a group IA or IIA light metal, or by substituted or unsubstituted ammonium)	16	...The nitrogen and the phosphorus are bonded directly to the same carbon
		17	...The nitrogen is bonded to an additional acyclic carbon or acyclic carbon chain, to which a -C(=X)X- group is bonded directly, wherein the X's are the same or diverse chalcogen
		18	....Preparing from a compound having a nitrogen containing hetero ring
		19	..The phosphorus is in a ring
		20	..Plural phosphori attached indirectly to each other by nonionic bonding
		21	...Plural phosphori bonded directly to the same carbon
		22	....Processes
		23	..Chalcogen attached indirectly to the phosphorus by nonionic bonding
		24	...The chalcogen is in a -C(=X)-group

- 25 ..Halogen attached indirectly to the phosphorus by nonionic bonding
- 26 ..Thiocarboxylic acids or salts thereof (i.e., compounds having the group $-C(=X)XH$, wherein the X's are the same or diverse chalcogens and at least one X is sulfur, and hydrogen may be replaced by a group IA or IIA light metal, or by substituted or unsubstituted ammonium)
- 27 ..Nitrogen bonded directly to the carbon of the $-C(=X)XH$ group or of its salt (e.g., dithiocarbamic acids, etc.)
- 28 ...Processes utilizing carbon disulfide
- 29 ..Thiosulfonic acids or salts thereof (i.e., compounds containing the thiosulfonate group, $-S(=O)(=O)-S-$, wherein the divalent sulfur is bonded directly to hydrogen, or to a group IA or IIA light metal or to substituted or unsubstituted ammonium)
- 30 ..Sulfonic acids or salts thereof (i.e., compounds containing the sulfonate group, $-S(=O)(=O)-O-$ wherein the single bonded oxygen is bonded directly to hydrogen, or to a group IA or IIA light metal or to substituted or unsubstituted ammonium)
- 31 ..Hydrophenanthrene ring system containing
- 32 ..Processes of sulfonating lignites, leonardites, coal, humic acids, bark or pitch, and the reaction products thereof
- 33 ..Petroleum sulfonic acids
- 34 ...Addition salts having organic nitrogen containing cation
- 35 ..Boron or phosphorus attached indirectly to the sulfonate group by nonionic bonding (e.g., phosphonium salts, etc.)
- 36 ..Chalcogen or $-C(=X)-$, wherein X is chalcogen, attached directly to the sulfonate sulfur by nonionic bonding
- 37 ..Nitrogen attached directly to the sulfonate sulfur by nonionic bonding (e.g., sulfamic acids, etc.)
- 38 ...Processes utilizing an inorganic sulfamic acid, or a salt thereof
- 39 ...Processes of forming the $-NH-S(=O)(O=)-O-$ group, wherein substitution may be made for hydrogen only
- 40 ...Additional salts having organic nitrogen containing cation
- 41 ..Benzene ring attached indirectly to the sulfonate group by acyclic nonionic bonding
- 42 ...Noncarbon atom in acyclic chain between the benzene ring and the sulfonate sulfur
- 43Nitrogen in the acyclic chain
- 44Chalcogen or $-C(=X)-$, wherein X is chalcogen, in the chain
- 45 ..Benzene ring bonded directly to the sulfonate sulfur (e.g., purification and neutralization of benzene sulfonic acids, etc.)
- 46 ...Having $-C(=X)-$, wherein X is chalcogen, attached indirectly to the sulfonate group by nonionic bonding (e.g., aldehydes, etc.)
- 47 ...Chalcogen or nitrogen bonded directly to the $-C(=X)-$ group
- 48Benzene ring bonded directly to each nitrogen of a $-NH-C(=X)-NH-$ group, wherein X is chalcogen and substitution may be made for hydrogen only
- 49At least one of the benzene rings is part of a naphthalene ring system
- 50Plural naphthalene ring systems attached indirectly to the $-NHC(=X)NH-$ group by nonionic bonding
- 51Stilbene containing

- 52Plural $-C(=X)-$ groups attached indirectly to the sulfonate group by nonionic bonding
- 53Plural carbons bonded directly to $-C(=X)-$
- 54Plural $-C(=X)-$ groups bonded directly to the same benzene ring
- 55Acyclic carbon bonded directly to the $-C(=X)-$ group
- 56The $-C(=X)-$ is part of a $-C(=X)X-$ group, wherein the X's may be the same or diverse chalcogens
- 57Nitrogen attached indirectly to the sulfonate group by nonionic bonding
- 58 ...Nitrogen attached indirectly to the sulfonate group by nonionic bonding
- 59Plural benzene rings bonded directly to each other or to the same acyclic carbon
- 60Stilbene containing
- 61Plural benzene rings bonded directly to the same nitrogen
- 62Plural nitrogens each bonded to two benzene rings (e.g., phenylaminophenylaminophenyl compounds, etc.)
- 63At least one of the benzene rings is part of a naphthalene ring system
- 64Oxygen bonded directly to a benzene ring
- 65Sulfonyl bonded directly to the nitrogen
- 66The nitrogen is attached indirectly to a benzene ring by acyclic nonionic bonding
- 67Additional nitrogen attached indirectly to the sulfonate group by nonionic bonding
- 68Polycyclo ring system consisting of benzene rings bonded directly to the sulfonate group
- 69Nitro or nitroso bonded directly to the polycyclo ring system
- 70Oxygen bonded directly to the polycyclo ring system (e.g., aminonaphthol sulfonic acid, etc.)
- 71Additional sulfonate group bonded directly to the polycyclo ring system (e.g., H acid, etc.)
- 72Halogen, plural nitrogens, or additional sulfonate group bonded directly to the polycyclo ring system
- 73 ...Nitro or halogen bonded directly to a benzene ring
- 74 ...Nonsulfonate chalcogen attached indirectly to the sulfonate group by nonionic bonding
- 75 ...Two benzene rings bonded to the nonsulfonate chalcogen (e.g., phenoxyphenyl compounds, etc.)
- 76 ...Plural carbons bonded directly to the nonsulfonate chalcogen (e.g., ethers, sulfones, etc.)
- 77Hydroxy group or nonsulfonate sulfur attached indirectly to a benzene ring by acyclic nonionic bonding
- 78 ...Halogen attached indirectly to the sulfonate group by nonionic bonding
- 79 ...The sulfonate group and oxygen are bonded directly to the same polycyclo ring system which consists of benzene rings
- 80Additional sulfonate group bonded directly to the polycyclo ring system
- 81Plural oxygens bonded directly to the same benzene ring
- 82 ...The sulfonate group, oxygen, and alkyl of at least 4 carbons are bonded directly to the same benzene ring
- 83 ...Halogen attached indirectly to the sulfonate group by nonionic bonding
- 84 ...Addition salts having organic nitrogen containing cation
- 85 ...Having $-C(=X)-$, wherein X is chalcogen, in the cation
- 86 ...Nitrogen double bonded to carbon in the cation (e.g., guanidinium salts, etc.)
- 87 ...Acyclic carbon to carbon unsaturation containing

88	...Plural benzene rings bonded directly to each other, or to the same acyclic carbon or acyclic carbon chain	105	...Having $-C(=X)-$, wherein X is chalcogen, attached indirectly to the sulfonate group by acyclic nonionic bonding
89	...Polycyclo ring system consisting of benzene rings bonded directly to the sulfonate group	106	...Plural nitrogens or plural $-C(=X)-$ groups, wherein X is chalcogen, attached indirectly to the sulfonate group by acyclic nonionic bonding
90	...Processes of sulfonating naphthalene per se or alkyl substituted naphthalene	107	...Chalcogen attached indirectly to the sulfonate group by acyclic nonionic bonding
91	...Sulfonate group and alkyl group of at least four carbons bonded directly to the same benzene ring	108	..Chalcogen attached indirectly to the sulfonate group by acyclic nonionic bonding
92	...With preservative, stabilizer, or color or odor affecting additive	109	...The chalcogen, X, is in a $-C(=X)-$ group
93	...Processes including alkylation of a benzene ring, and the products thereof	110	...Plural chalcogens attached indirectly to the sulfonate group by acyclic nonionic bonding
94	....The alkylating agent is an olefin	111	...Plural carbons bonded directly to the chalcogen (e.g., ethers, etc.)
95	....Sulfonation processes	112	...Addition salts having organic nitrogen containing cation
96	....Purification or recovery	113	..Halogen attached indirectly to the sulfonate group by acyclic nonionic bonding
97	....Neutralization or acidification	114	..Addition salts having organic nitrogen containing cation
98	...Sulfonation utilizing sulfur trioxide or oleum (e.g., sulfonation of benzene or toluene with oleum, etc.)	115	..Processes (e.g., neutralization, stabilization, etc.)
99	...Sulfonation utilizing sulfuric acid (e.g., sulfonation of benzene or toluene with sulfuric acid, etc.)	116	...Decarboxylation, hydrogenation or formation of carbon-to-carbon unsaturation
100	..Polycyclo alicyclic ring system attached directly or indirectly to the sulfonate group by nonionic bonding	117	...Conversion of sulfur containing hetero ring compounds to sulfonic acids
101	..Plural sulfonate groups attached indirectly to each other by acyclic nonionic bonding	118	...Oxidation of organic sulfur compounds to sulfonic acids
102	...Nitrogen or $-C(=X)-$, wherein X is chalcogen, attached indirectly to the sulfonate groups by nonionic bonding	119	...Hydrolysis of sulfonyl halides
103	...Plural nonsulfonate chalcogens attached indirectly to the sulfonate groups by nonionic bonding	120	...Formation of sulfonic acids or sulfonic acid salts utilizing inorganic sulfonating agents (e.g., reaction of alcohols or alkyl halides with sulfurous acid, etc.)
104	..Nitrogen attached indirectly to the sulfonate group by acyclic nonionic bonding	121	...Utilizing sulfur dioxide and oxygen (i.e., sulfoxidation)
		122	...Sulfurous acid or salt thereof reacted with unsaturated hydrocarbon

123	....Utilizing sulfur trioxide, oleum, sulfuric acid or halosulfonic acid	424	....Of alkali metal phenolates
124	...Purification or recovery	425	.....Having plural rings
125	..Sulfinic or sulfenic acids or salts thereof (i.e., compounds containing the sulfinic group, -S(=O)O-, or the sulfenyl group, -S-O-, wherein the single bonded oxygen is bonded directly to hydrogen, or to a group IA or group IIA light metal or to substituted or unsubstituted ammonium)	426	...Sulfur
126	..Nitrogen attached indirectly to a sulfinate group by acyclic nonionic bonding	427	....Polycyclic ring system
400	..Carboxylic acids and salts thereof	428	.....Indenyl or hydrindenyl
401	..Racemization or separation of optical isomers	429	....Sulfoxyl
402	...Physical resolution	430	.....Nitrogen
403	..Hydrophenanthrene nucleus	431	....Carboxyl, or salt thereof, in side chain having sulfur bonded directly to a ring
404	...1,4a-dimethyl hydrophenanthrene-1 carboxylic acids or salts thereof	432	...Carboxyl, or salt thereof, bonded directly to a ring
405	..Aromatic	433	...Nitrogen bonded directly to carbon of organic radical (e.g., amino acids, etc.)
406	...Preparation by carbonylation	434	....Nitro or nitroso
407	...Formation of carboxyl group by oxidation	435	.....Plural rings
408	....Of aromatic compound	436	.....Plural rings bonded directly to the same carbonyl
409	.....Alkyl side chain oxidized	437	.....Plural nitrogens
410	.....Nitrogen containing oxidant	438	.....Halogen
411	.....Sulfur containing oxidant	439	...Ureido, guanido, or hydrazine
412	.....Air, oxygen, or ozone oxidant	440	...Nitrogen double bonded directly to carbon (e.g., amidine, ketimine, etc.)
413	.....Multistage	441	....Plural rings bonded directly to the same carbon
414	.....With recycle or recovery of reaction component	442	...Nitrogen not bonded directly to a ring
415	.....Gas phase	443	.....In same chain as carboxyl, or salt thereof
416	.....Halogen containing catalyst, initiator, or promoter utilized	444	.....Oxy
417	.....Initiator or promoter used with catalyst	445	.....Phenyl alanines
418	....Of oxy or carbonyl containing compound	446	.....Di-oxy phenyl alanines
419	.....Hypohalite as oxidant	447	.....Phenoxphenyl alanines
420	.....Nitrogen containing oxidant	448	.....Plural nitrogens
421	.....Air, oxygen, or ozone oxidant	449	.....Halogen
422	....Of halo alkyl containing compound	450	.....Amide
423	...Preparation by carbonation	451	....Oxy
		452	...Oxy
		453	....Carboxyl, or salt thereof, nitrogen and oxygen all bonded directly to the same benzene ring
		454	....Aryl-N-Aryl
		455	....Amide
		456	...Halogen
		457	...Plural rings with nitrogen bonded directly to at least one ring
		458	...Carboxyl, or salt thereof, bonded directly to a ring
		459	...Aldehyde or ketone
		460	...Two rings bonded directly to the same carbonyl

461	....Polycyclo ring system	494	....Purification or recovery per se
462	.....Bicyclo ring system	495	....Additional unsaturation
463	....Oxy	496	....Carboxyl, or salt thereof, not bonded directly to ring
464	.....Phenoxy alkanolic acids	497	..Preparing alicyclic acids by carbonylation
465	...Oxy	498	..Plural alicyclic rings
466	....Polycyclo ring system	499	...Tricyclo ring system
467	.....Carboxyl bonded directly to naphthylene ring system	500	...Two rings only
468	....Plural rings bonded directly to the same carbon	501	...Orthofused
469	....Rings bonded directly to each other	502	....2,2,1-bicyclo
470	....Oxy, not bonded directly to a ring, in same side chain as carboxyl, or salt thereof	503	..Cyclopentyl (e.g., prostoglandins, etc.)
471	....Oxy, bonded directly to a ring, in same side chain as carboxyl, or salt thereof	504	...Cyclopentyl bonded to -COOR, -CCOOR, or -CCCOOR
472	.....Halogen	505	..Cyclobutyl
473	....Carboxyl, or salt thereof, bonded directly to a ring	506	..Cyclopropyl
474	.....Halogen	507	..Alicyclic acids having an element other than oxygen, carbon, or hydrogen
475	.....Phenolic hydroxy or metallate	508	..Alicyclic acids having an oxy, aldehyde, or ketone group
476	.....Poly phenolic hydroxy or metallate	509	..Alicyclic polycarboxylic acids
477	.....Salicyclic acid per se or salt thereof	510	..Alicyclic acids having unsaturation
478	....Phenolic hydroxy or metallate	511	..Naphthenic acids or salts thereof
479	...Decarboxylation of polycarboxylic acid or salt	512	..Acyclic
480	...Polycarboxylic acids or salts thereof	512.2	...Preparing by oxidation of hydrocarbon mixtures
481	....Prepared by disproportionation	512.4	....Plural -COO- groups in compound formed
482	....Preparation by isomerization	513	...Preparation from source of undetermined composition (e.g., industrial waste, etc.)
483	....Preparation by hydrolysis of amide, anhydride, or ester	514	....Nitrogen containing acid produced
484	....Preparation by hydrolysis of nitrile	515	...Preparation by degradation of carbohydrates
485	....Purification or recovery per se	516	...Preparation by hydrolysis of proteins
486	.....By crystallization	517	...Preparation by carbonylation
487	.....By reaction of undesired component	518	...Of aldehyde or ketone
488	....Plural rings	519	...Of alcohol or alcoholate
489	....Carboxyl not directly attached to a ring	520	...Of halogenated hydrocarbon
490	...Naphthyl group	521	...Of hydrocarbon
491	...Plural rings bonded directly to the same carbon	522	.....Group VIII metal containing catalyst utilized
492	...Rings bonded directly to each other	523	...Formation of carboxyl group by oxidation
493	...Monocyclic	524	....Of carboxylic acid or ester
		525	.....Of oxy acid or ester
		526	....Of nitrogen containing compound

527	....Of ketone	563	.....Glutamine per se or salt thereof
528	.....Cyclic ketone or mixture thereof with cyclic alcohol	564	.....Oxy containing
529	.....Two stage oxidation from hydrocarbon	565	.....Polycarboxylic
530	.....With recycle or recovery of reaction component	566	.....Ethylene diamine tetraacetic acid per se or salt thereof
531	....Of aldehyde	567	....Oxy, aldehyde, or ketone
532	.....Producing unsaturated acid	568	.....Polycarboxylic
533	.....Liquid phase oxidation	569	....Pantothenic acid per se or salt thereof
534	.....Group VIII metal containing catalyst utilized	570	....Threonine per se or salt thereof
535	.....Group V metal containing catalyst utilized	571	....Polycarboxylic
536	.....Producing acetic acid	572	.....Nitrilotriacetic acid per se or salt thereof
537	....Of ether	573	.....Glutamic acid per se or salt thereof
538	....Of alcohol	574	....Halogen or unsaturation
539	....Caustic oxidant	575	....Alpha nitrogen
540	....Nitrogen containing oxidant	576	....Beta alanine per se or salt thereof
541	....Of halogenated hydrocarbon	577	...Aldehyde or ketone
542	....Of hydrocarbon	578	...Polycarboxylic
543	....Alicyclic	579	...Oxy
544	.....Olefin	580	....Purification or recovery per se
545	.....Producing unsaturated acid	581	....Sulfur
546	.....Group VIII metal containing catalyst utilized	582	....Polycarboxylic
547	.....Group V metal containing catalyst utilized	583	.....Ether
548	.....Producing acetic acid	584	.....Citric acid per se or salt thereof
549	.....Alkane	585	.....Tartaric acid per se or salt thereof
550	...Formation of carboxyl group by carbonation	586	....Halogen
551	....Of C-metallated compound	587	....Polyoxy
552	....Of alkali metal salt of carboxylic acid	588	....Alkoxy
553	...Nitrogen bonded to carbon of organic radical (e.g., amino acids, etc.)	589	....Lactic acid per se or salt thereof
554	....Purification or recovery per se	590	...Polycarboxylic
555	....Carbamic acids or salts thereof	591	....Preparation by isomerization
556	....Sulfur or selenium	592	....Preparation by hydrogenation
557	.....Alpha N, beta S - acids or salts thereof	593	....Purification or recovery per se
558	.....Penicillamine per se or salt thereof	594	....Element other than C,H,O,N, or halogen
559	.....Methionine per se or salt thereof	595	....Unsaturated
560	....Ureido, hydrazino, or nitrogen double bonded directly to carbon	596	....Halogen
561	....Plural nitrogens	597	....Oxalic acid per se or salt thereof
562	.....Lysine per se or salt thereof	598	...Unsaturated
		599	....Formation of ethylenic unsaturation

600	....Purification or recovery per se	625	.Sulfohydroxamic acids, chalcogen analogs or salts thereof (i.e., compounds having the -S(=O)(=O)-N(R)-XH group, wherein R may be hydrogen or substitution for hydrogen, X is chalcogen, and H of -XH may be replaced by a group IA or IIA light metal, or by substituted or unsubstituted ammonium)
601	....Sorbic acid per se or salt thereof		
602	...Halogen		
603	....Preparation by halogenating acid or anhydride		
604	....Preparation by dehalogenation		
605	....Fluorine containing		
606	...Saturated lower fatty acids		
607	....Acetic acid per se or salt thereof	800	.Hydroxamic acid halides or chalcogen analogs thereof (i.e., compounds having the -C(=X)NH-halo group, wherein X is chalcogen and substitution may be made for hydrogen only)
608	....Purification or recovery per se		
609	....Formic acid per se or salt thereof		
620	.Nitrolic acids or salts thereof (i.e., compounds having the group -C(=NOH)-N(=O)(=O), wherein the hydrogen may be replaced by a group IA or IIA light metal, or by substituted or unsubstituted ammonium)	801	..Additional nitrogen bonded directly to the -C(=X)- group (e.g., urea halides, etc.)
621	.Hydroxamic acids, chalcogen analogs or salts thereof (i.e., compounds having the -C(=X)-N(R)-XH group or the -C(XH)=NXR group, wherein R may be hydrogen or substitution for hydrogen, the X's in each group may be the same or diverse chalcogens, and H of -XH in each group may be replaced by a group IA or IIA light metal, or by substituted or unsubstituted ammonium)	802	.Imidic acid halides (i.e., compounds having the -N=CH-halo group, wherein substitution may be made for hydrogen only)
622	..Carbocyclic ring bonded directly to the carbon of the acid group	803	..Additional halogen bonded directly to the carbon of the imidic halide group (i.e., -N=(halo)C(halo)
623	..Nitrogen attached to the acid group directly or indirectly by acyclic nonionic bonding (e.g., N-hydroxy ureas, dihydroxamic acids, etc.)	804	..Chalcogen attached directly to the nitrogen of the imidic halide group by nonionic bonding (i.e., -X-N=CH-halo, wherein X is chalcogen)
624	.Imidic acids, chalcogen analogs or salts thereof (i.e., compounds having the group -N-C(XH)-, wherein X is chalcogen and the hydrogen may be replaced by a group IA or IIA light metal, or by substituted or unsubstituted ammonium)	805	..Nitrogen attached directly to the nitrogen of the imidic halide group by nonionic bonding (i.e., HNH-N=CH-halo, wherein substitution may be made for hydrogen only)
		806	.Boron halides (i.e., compounds having halogen attached directly to boron by nonionic bonding)
		807	..Phosphorus attached directly or indirectly to the boron by nonionic bonding)
		808	.Phosphorus halides (i.e., compounds having halogen attached directly to phosphorus by nonionic bonding)
		809	..Nitrogen bonded directly to the phosphorus
		810	...The phosphorus and the nitrogen are in the same ring

- 811 ..Additional phosphorus attached directly or indirectly to the phosphorus by nonionic bonding
- 812 ..The phosphorus is in a ring
- 813 ..Sulfur bonded directly to the phosphorus
- 814 ...Preparing utilizing an inorganic compound containing phosphorus and sulfur
- 815 ...Forming phosphorus to carbon bond
- 816 ..Oxygen bonded directly to the phosphorus
- 817 ..Halogen attached indirectly to the phosphorus by acyclic nonionic bonding
- 818 ...Forming phosphorus to halogen bond
- 819 ...Forming phosphorus to carbon bond
- 820 ..Forming phosphorus to carbon bond
- 821 ..Sulfur halides (i.e., compounds having halogen attached directly to sulfur by nonionic bonding)
- 822 ..Nitrogen bonded directly to the sulfur
- 823 ...Phosphorus, $-C(=X)-$, wherein X is chalcogen, additional chalcogen attached directly to the nitrogen by nonionic bonding
- 824 ..The halogen is fluorine
- 825 ...Chalcogen double bonded directly to the sulfur (e.g., sulfonyl fluorides, etc.)
- 826 ...Benzene attached directly or indirectly to the sulfur by nonionic bonding
- 827 ..Chalcogen double bonded directly to the sulfur (e.g., sulfinyl halides, etc.)
- 828 ...Plural chalcogens double bonded directly to the sulfur (e.g., sulfonyl halides, etc.)
- 829 ...Processes for forming the sulfonyl halide group utilizing elemental halogen
- 830 ...Preparing utilizing thionyl halide or carbonyl dihalide (e.g., phosgene, etc.)
- 831 ...Plural sulfonyl halide groups attached indirectly to each other by nonionic bonding
- 832 ...Nitrogen, other than as nitro or nitroso, attached indirectly to the sulfur by nonionic bonding
- 833 ...Chalcogen attached indirectly to the sulfur by nonionic bonding
- 834 ...Halogen attached indirectly to the sulfur by nonionic bonding
- 835 ..Chalcogen or nitrogen attached indirectly to the sulfur by nonionic bonding
- 836 ..Perchloro methyl mercaptan per se (i.e., trichloromethane sulfenyl chloride)
- 837 .Compounds having the $-(O=S(=O))-$ NH-halo group (i.e., N-halo sulfonamides, wherein substitution may be made for hydrogen only)
- 838 .Thiocarboxylic halides (i.e., compounds having the $-C(=S)-$ halo group)
- 839 ..Additional halogen bonded directly to the $-C(=S)-$ group (e.g., thiophosgene, etc.)
- 840 .Carboxylic halides (i.e., compounds having the $-C(=O)-$ halo group)
- 841 ..With preservative or stabilizer
- 842 ..Boron or phosphorus attached directly or indirectly to the carbonyl group by nonionic bonding
- 843 ..Carbonyl bonded directly to the carbonyl group (e.g., oxalyl chlorides, etc.)
- 844 ..Nitrogen bonded directly to the carbonyl group (e.g., carbamyl chlorides, etc.)
- 845 ...Chalcogen or additional carbonyl bonded directly to the nitrogen
- 846 ...Processes utilizing phosgene as a reactant
- 847 ..Phosgene, per se
- 848 ..Processes utilizing carbon monoxide as a reactant
- 849 ..Fluorine is the halogen (i.e., carboxylic fluorides)
- 850 ...Plural $-C(=O)-F$ groups attached indirectly to each other by nonionic bonding
- 851 ...Processes for forming the carbonyl group

- 852 ...Processes for forming the carbonyl to fluoride bond
- 853 ..Plural $-C(=O)$ -halo groups attached indirectly to each other by nonionic bonding
- 854 ...Preparing utilizing phosgene
- 855 ...Plural $-C(=O)$ -halo groups bonded directly to the same benzene ring
- 856 ..Processes
- 857 ...Phosgene reactant
- 858 ...Ketene reactant
- 859 ...Forming the carbonyl group
- 860 ...By oxidizing a halogenated olefin
- 861 ...Forming the carbonyl to halide bond
- 862 ...Reactant having halogen bonded directly to sulfur by nonionic bonding
- 863 ...Elemental halogen or hydrogen halide utilized
- 864 ...Halogenation
- 865 ...Dehalogenation or dehydrohalogenation
- 866 ...Purification or recovery
- 867 ..Alicyclic ring containing
- 868 ..Nitrogen attached indirectly to the carbonyl group by nonionic bonding
- 869 .Containing $-C(=X)-CN$, wherein X is chalcogen (e.g., carbonyl cyanides, etc.)
- 870 ..Sulfonyl isocyanates or sulfonyl isothiocyanates, (i.e., compounds having the $-S(=O)(=O)-N=C=X$ group, wherein X is oxygen or sulfur)
- 871 .Containing $-C(=X)-N=C=X$ or $-C(=X)-X-N=N-X-$, wherein the X's may be the same or diverse chalcogens
- 872 ..Sulfonic anhydrides (i.e., compounds having the $-S(=O)(=O)-O-S(=O)(=O)-$ group)
- 873 .Containing $-S(=O)(=O)-CN$ or $-S(=O)(=O)-N=S=O$
- 874 .Containing $-C(=X)-NH-X-C(=X)-$ or $-C(=X)-NH-X-S(=O)(=O)-$, wherein substitution may be made for hydrogen only, and the X's may be the same or diverse chalcogens
- 875 .Containing $-C(=NH)-X-C(=X)-$, wherein substitution may be made for hydrogen only, and the X's may be the same or diverse chalcogens
- 876 .Phosphorus bonded directly to the single bonded X of a $-C(=X)-X-$ group, wherein the X's may be the same or diverse chalcogens
- 877 .Phosphorus bonded directly to cyano or to $-N=C=X$, wherein X is chalcogen
- 878 .Two phosphori bonded directly to the same divalent chalcogen atom (e.g., pyrophosphorus compounds, etc.)
- 879 .Containing $-C(=X)-X-N(=O)$ or $-C(=X)-X-S(=O)(=O)-$, wherein the X's may be the same or diverse chalcogens
- 880 .Containing $-C(=X)-NH-X-NH-C(=X)-$ or $-C(=X)-X-NH-S(=O)(=O)-$, wherein substitution may be made for hydrogen only, and the X's may be the same or diverse chalcogens
- 881 .Containing $-C(=X)-NH-X$ -halo, wherein substitution may be made for hydrogen only, and the X's may be the same or diverse chalcogens
- 882 .Boron bonded directly to the single bonded X of a $-C(=X)-X-$ group, wherein the X's may be the same or diverse chalcogens
- 883 .Two borons bonded directly to the same divalent chalcogen atom (e.g., boroxoles, etc.)
- 884 .Boron bonded directly to the single bonded oxygen of a $-S(=O)(=O)-O-$ group
- 885 .Compounds having the $-S-SCN$ group bonded directly to carbon, which carbon may be single bonded to any atom but may be multiple bonded only to carbon
- 886 .Thiocarboxylic acid anhydrides (i.e., compounds having the $-C(=X)-X-C(=X)-$ group, wherein the X's may be the same or diverse chalcogens and at least one X is sulfur)

- 887 .Carboxylic acid anhydrides
(i.e., compounds having the -
C(=O)-O-C(=O)- group)
- 888 ..Processes of forming the -
C(=O)-O-C(=O)- group
- 889 ...Aldehyde reactant
- 890 ...Carbon monoxide or metal
carbonyl reactant
- 891Ether or carboxylic acid
ester reactant
- 892 ..Ketone or ketene reactant
- 893 ...Ether or carboxylic acid ester
reactant
- 894 ..Carboxylic acid salt reactant
- 895 ...Dehydration of two like or
different molecules of
carboxylic acid
- 896Vapor phase
- 897 ...Carboxylic acid halide
reactant
- 898 ..Purification or recovery
- 899 .Selenium or tellurium containing

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