

Peroxide Forming Chemicals: The following lists of chemicals are not exhaustive. Researchers must consult the SDS and other information sources for the chemicals used in their work areas to determine the potential for peroxide-formation.

Group A

Chemical Name	CAS	Synonyms	State
Butadiene ⁽¹⁾	106-99-0	1,3-Butadiene	l
Chloroprene ⁽¹⁾	126-99-8	2-Chloro-1,3-butadiene	l
Divinyl acetylene	821-08-9	1,5-Hexadien-3-yne	l
Isopropyl ether	108-20-3		l
Tetrafluoroethylene ⁽¹⁾	116-14-3		l
Vinylidene chloride	75-35-4	1,1-Dichloroethylene	l

Group B

Chemical Name	CAS	Synonyms	State
Acetal	105-57-7		l
Acetaldehyde	75-07-0		l
Benzyl alcohol	100-51-6		l
2-Butanol**	78-92-2		l
Cyclohexanol	108-93-0		l
Cyclohexene	110-83-8		l
2-Cyclohexen-1-ol	822-67-3		l
Cyclopentene	142-29-0		l
Decahydronaphthalene	91-17-8	Decalin	l
Diacetylene	460-12-8		g
Dicyclopentadiene	77-73-6		l
Diethylene glycol dimethyl	111-96-6	Diglyme	l
Dioxane	123-91-1	1,4-Dioxane	l
Ethylene glycol	110-71-4	1,2-Dimethoxyethane; Glyme	l
Ethyl ether	60-29-7	Diethyl ether	l
4-Heptanol	589-55-9		l
2-Hexanol**	626-93-7		l
Isopropyl benzene	98-82-8	Cumene	l
Methyl acetylene	74-99-7	Propyne	g
3-Methyl-1-butanol	123-51-3	Isoamyl alcohol	l
Methyl cyclopentane	96-37-7		l
Methyl isobutyl ketone	108-10-1	Methyl-i-butyl ketone; MIBK; Isobutyl methyl ketone; Isopropylacetone; 4-Methyl-2-pentanone	l
4-Methyl-2-pentanol	108-11-2	Isobutyl methyl carbinol; 3-MIC; MAOH; MIBC	l

Group A: Chemicals that form explosive levels of peroxides without concentration.

Group B: Chemicals that form explosive levels of peroxides on concentration.

Group C: Chemicals that may auto-polymerize as a result of peroxide accumulation.

Group D: Chemicals that may form peroxides but cannot be clearly placed in Groups A-C

Chemical Name	CAS	Synonyms	State
2-Pentanol**	6032-29-7		l
4-Penten-1-ol	821-09-0		l
1-Phenylethanol	98-85-1	alpha-Methyl-benzyl alcohol	l
2-Phenylethanol	60-12-8	Phenethyl alcohol	l
2-Propanol**	67-63-0	Isopropanol; Isopropyl alcohol; IPA; sec-Propyl alcohol	
Tetrahydrofuran	109-99-9		l
Tetrahydronaphthalene	119-64-2	1,2,3,4-Tetrahydronaphthalene; Tetralin solvent	l
Vinyl Ethers			
Other secondary alcohols			

Group C

Chemical Name	CAS	Synonyms	State
Acrylic acid ⁽²⁾	79-10-7		l
Acrylonitrile ⁽²⁾	107-13-1		l
Butadiene ⁽³⁾	106-99-0		g
Chloroprene ⁽³⁾	126-99-8	2-Chloro-1,3-butadiene	g
Chlorotrifluoroethylene ⁽³⁾	79-38-9		g
Methyl methacrylate ⁽²⁾	80-62-6		l
Styrene	100-42-5		l
Tetrafluoroethylene ⁽³⁾	116-14-3		g
Vinyl acetate	108-05-4		l
Vinylacetylene	689-97-4	Buten-3-yne; Butenyne; 1-Buten-3-yne	g
Vinyl chloride ⁽³⁾	75-01-4	Mono-chloroethylene	g
Vinylidene chloride	75-35-4	1,1-Dichloroethylene	l
2-Vinyl pyridine	100-69-6		l
4-Vinyl pyridine	100-43-6		l

Note: **Secondary alcohols can be peroxide-forming chemical hazards, particularly anhydrous form of the alcohols, and are used in chemical processes (e.g., heating, distilling, performing chemical reactions, performing bulk evaporations). If these chemicals are used only for wipe cleaning or solvent extractions, risk is lower, nonetheless, peroxide may form when exposed to lights and air.

Group D

Chemical Name	CAS	Chemical Name	CAS
Acrolein	107-02-8	1,3-Dioxepane	505-65-7
Allyl ether ⁽⁴⁾	557-40-4	Di(1-propynyl) ether ⁽⁶⁾	111-43-4
Allyl ethyl ether	557-31-3	Di(2-propynyl) ether	
Allyl phenyl ether	1746-13-	Di-n-propoxymethane ⁽⁴⁾	505-84-0
p-(n-Amyloxy)benzoyl chloride	36823-	1,2-Epoxy-3-	4016-14-
n-Amyl ether	693-65-2	1,2-Epoxy-3-phenoxypropane	122-60-1
Benzyl n-butyl ether ⁽⁴⁾	588-67-0	p-Ethoxyacetophenone	1676-63-
Benzyl ether ⁽⁴⁾	103-50-4	1-(2-Ethoxyethoxy)ethyl acetate	
Benzyl ethyl ether ⁽⁴⁾	539-30-0	2-Ethoxyethyl acetate	111-15-9
Benzyl methyl ether	538-86-3	(2-Ethoxyethyl)-o-benzoyl	604-63-7
Benzyl-1-naphthyl ether ⁽⁴⁾	613-62-7	1-Ethoxynaphthalene	5328-01-
1,2-Bis(2-chloroethoxy)ethane	112-26-5	o,p-Ethoxyphenyl isocyanate	
Bis(2-ethoxyethyl)ether	112-36-7	1-Ethoxy-2-propyne	
Bis(2-(methoxyethoxy)ethyl)	143-24-8	3-Ethoxypropionitrile	2141-62-
Bis(2-chloroethyl) ether	111-44-4	2-Ethylacrylaldehyde oxime	99705-
Bis(2-ethoxyethyl) adipate	109-44-4	2-Ethylbutanol	97-95-0
Bis(2-ethoxyethyl) phthalate	605-54-9	Ethyl-b-ethoxypropionate	763-69-9
Bis(2-methoxyethyl) carbonate	626-84-6	2-Ethylhexanal	123-05-7
Bis(2-methoxyethyl) ether	119-96-6	Ethyl vinyl ether	109-92-2
Bis(2-methoxyethyl) phthalate	117-82-8	Furan	110-00-9
Bis(2-methoxymethyl) adipate		2,5-Hexadiyn-1-ol	28255-
Bis(2-n-butoxyethyl) phthalate	117-83-9	4,5-Hexadien-2-yn-1-ol	2749-79-
Bis(2-phenoxyethyl) ether	622-87-7	n-Hexyl ether	112-58-3
Bis(4-chlorobutyl) ether	6334-96-	o,p-Iodophenetole	
Bis(chloromethyl) ether	542-88-1	Isoamyl benzyl ether ⁽⁴⁾	122-73-6
2-Bromomethyl ethyl ether	13057-	Isoamyl ether ⁽⁴⁾	544-01-4
β-Bromophenetole	589-10-6	Isobutyl vinyl ether	109-53-5
o-Bromophenetole	583-19-7	Isophorone	78-59-1
p-Bromophenetole	588-96-5	β-Isopropoxypropionitrile ⁽⁴⁾	110-47-4
3-Bromopropyl phenyl ether	588-63-6	Isopropyl-2,4,5-trichlorophenoxy	93-78-7
1,3-Butadiyne	460-12-8	Limonene	138-86-3
Buten-3-yne	689-97-4	1,5-p-Methadiene	
Tert-Butyl ethyl ether	637-92-3	Methyl p-(n-amylloxy)benzoate	
Tert-Butyl methyl ether	1634-04-	4-Methyl-2-pentanone	108-10-1
n-Butyl phenyl ether	1126-79-	n-Methylphenetole	
n-Butyl vinyl ether	111-34-2	2-Methyltetrahydrofuran	96-47-9
Chloroacetaldehyde	621-62-5	3-Methoxy-1-butyl acetate	4435-53-
2-Chlorobutadiene	126-99-8	2-Methoxyethanol	109-86-4
1-(2-Chloroethoxy)-2-	2243-44-	3-Methoxyethyl acetate	
Chloroethylene	75-01-4	2-Methoxyethyl vinyl ether	1663-35-

Chemical Name	CAS	Chemical Name	CAS
Chloromethyl methyl ether ⁽⁵⁾	107-30-2	Methoxy-1,3,5,7-	
β-Chlorophenetole	622-86-6	β-Methoxypropionitrile	110-67-8
o-Chlorophenetole	614-72-2	m-Nitrophenetole	621-52-3
p-Chlorophenetole	622-61-7	1-Octene	111-66-0
Cyclooctene ⁽⁴⁾	931-88-4	Oxybis(2-ethyl acetate)	628-68-2
Cyclopropyl methyl ether	540-47-6	Oxybis(2-ethyl benzoate)	
Diallyl ether ⁽⁴⁾	557-40-4	β,β-Oxydipropionitrile	1656-48-
p-Di-n-butoxybenzene		1-Pentene	109-67-1
1,2-Dibenzoyloxyethane ⁽⁴⁾	622-22-0	Phenoxyacetyl chloride	701-99-5
p-Dibenzoyloxyethane ⁽⁴⁾		α-Phenoxypropionyl chloride	122-35-0
1,2-Dichloroethyl ethyl ether	623-46-1	Phenyl-o-propyl ether	
2,4-Dichlorophenetole	5392-86-	p-Phenylphenetone	
Diethoxymethane ⁽⁴⁾	462-95-3	n-Propyl ether	111-43-3
2,2-Diethoxypropane	126-84-1	n-Propyl isopropyl ether	627-08-7
Diethyl	87-13-8	Sodium 8,11,14-	
Diethyl fumarate ⁽⁴⁾	623-91-6	Sodium ethoxyacetylde ⁽⁶⁾	
Diethyl acetate ⁽⁴⁾	105-57-7	Tetrahydrofuran	142-68-7
Diethylketene ⁽⁶⁾	24264-	Triethylene glycol diacetate	111-21-7
m,o,p-Diethoxybenzene		Triethylene glycol dipropionate	141-34-4
1,2-Diethoxyethane	629-14-1	1,3,3-Trimethoxypropane ⁽⁴⁾	
Dimethoxymethane ⁽⁴⁾	109-87-5	1,1,2,3-Tetrachloro-1,3-	921-09-5
1,1-Dimethoxyethane ⁽⁴⁾	534-15-6	4-Vinyl cyclohexene	100-40-3
Dimethylketene ⁽⁶⁾		Vinylene carbonate	872-36-6
3,3-Dimethoxypropene	6044-68-	Vinylidene chloride ⁽⁴⁾	75-35-4
2,4-Dinitrophenetole	610-54-8		

1. When stored as a liquid monomer.
2. Although these form peroxides, no explosions involving these monomers have been reported.
3. When stored in liquid form, these chemicals form explosive levels of peroxides without concentration. They may also be stored as a gas in gas cylinders. When stored as a gas, these chemicals may auto-polymerize as a result of peroxide accumulation.
4. These chemicals easily form peroxides and should probably be considered under part B.
5. OSHA-regulated carcinogen
6. Extremely reactive and unstable compound.

Source: Kelly, R.J., Review of Safety Guidelines for Peroxidizable Organic Chemicals, Chemical Health and Safety, American Chemical Society, 1996, Sept, 28-36.