Safe Handling of Peroxide Forming Chemicals

BACKGROUND INFORMATION

Chemicals that react with oxygen to make peroxides create materials that can explode with impact, heat, or friction (a partial list is presented on the following page.) Peroxide-forming compounds can be divided into three hazard categories based on method of reaction.

I. **Spontaneous Decomposition:** Compounds such as divinyl acetylene and isopropyl ether form peroxides that can spontaneously decompose.

II. **Requires External Energy for Decomposition:** Compounds that form peroxides, but require the addition of a certain amount of energy to decompose explosively. Examples of these chemicals include dicyclopentadiene, diethyl ether, dioxane, tetrahydrofuran and vinyl ethers.

III. **Shock and Heat Sensitive:** Materials that can form peroxide polymers, a highly reactive form of peroxide, which is extremely shock and heat sensitive. Representative compounds include butadiene, chloroprene, methyl methacrylate, vinyl pyridine, tetrafluoroethylene, acrylonitrile and styrene.

GUIDELINES:

1. Date all peroxide formers upon receipt and upon opening. **Discard peroxide formers 3 months after opening or 12 months after receipt.** Ensure that you know whether or not an inhibitor has been added by the manufacturer.

2. Do not open any container of a peroxide forming chemical that has obvious crystal formation. Do not handle or force open lids -- treat as potentially explosive. Call EH&S for assistance 747-7124.

3. Maintain an inventory of peroxide forming chemicals. Dispose of chemicals by their expiration date.

4. Do not purchase large quantities of peroxide forming chemicals. Purchase the amount that you will actually use in a 3-6 month time period.

5. DO NOT store peroxide forming chemicals in open, partially empty, or transparent containers; these conditions promote formation of peroxides. (DO NOT expose to oxygen)

PEROXIDE FORMING CHEMICALS

Acrylic acid
Allyl ether
Allyl ethyl ether
Allyl phenyl ether
pAnisaldehyde
mAnisaldehyde
mAnisyl alcohol
Azoxydianisole
Benzoin methyl ether
Benzyl ether
1 ,2Bis(2chloroethoxy)ethane(pract)
Bis(2ethoxyethyl)adipate
Bis(2ethoxy ethyl)ether
Bis(2ethoxy ethyl)sebacate
Bis(2methoxyethoxy)ethane(pract)
Bis(2methoxyethyl)ether
Bis(pentyloxy)azoxybenzene
pBromoanisole
2Bromoethyl ethyl ether
2Bromoethyl methyl ether
2Butoxyethanol
2(butoxyethoxy)ethyl acetate(pract)
tButyl ethyl ether
tButyl methyl ether
cyclooctene
Decahydronaphthalene
1,2Dichloroethyl ethyl ether
2,4Dichlorophenoxyacetic acid
Diethoxymethane
2,2Diethoxypropane
Diethyl ethoxymethylene malonate
2,3Dihydro2,5dimethoxyfuran(pract)
Diisobutylene(pract)
2,5Dimethoxyaniline(pract)
3,4Dimethoxybenzaldehyde
3,3'Dimethoxy benzidine
2,4Dimethoxybenzoic acid
4,4Dimethoxy2butanone
1 ,2Dimethoxyethane
Dimethoxymethane
2,2Dimethoxypropane
2,5 Dimethoxytoluene
pDioxane
1,3Dioxolane
1,2Epoxy3isopropoxypropane
4'Ethoxyacetophenone
pEthoxybenzaldehyde
oEthoxybenzoic acid
2(2Ethoxyethoxy)ethanol
2(2Ethoxyethoxy)ethyl acetate
pEthoxyphenol
Ethylenebis(2oxyethyl acetate)
Ethyl ether
pFormylphenoxyaceticacid)
Furan pHexyloxybenzaldehyde
(pHydroxyphenoxy)acetic acid
Isoeugenol
Isopentyl ether
Isophorane
Isoprene
Isopropyl ether
Ligroine
Methofuran
Methoxyaceticacid
pMethoxybenzylamine
2Methoxyethanol
2(2Methoxyethoxy)ethanol
2Methoxyethyl acetate
2Methoxyethylamine
1Methoxynaphthalene
4Methoxy2nitroaniline
mMethoxyphenol
Methoxyphenylacetic acid
oMethoxyphenyl isocyanate
3Methoxypropionitrile
oMethoxypropionitrile
oNitrophenyl phenylether
2,5Norbornadiene
4,4'Oxydiphenol
pPentyloxyaniline
pPentyloxybenzaldehyde
pPentyloxybenzoylchloride
Phenoxyacetic acid
Phenoxyacetyl chloride
m(mPhenoxyphenoxy)phenol
Propylether
Styrene
Tetraethylene glycol
Tetraethyleneglycolmonomethylether
Trimethoxybenzaldehyde
Trimethoxypropene
Vinyl acetate