

## 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