

Safe Working Procedure for the Use of Peroxides

Peroxide reagents, such as hydrogen peroxide, MCPBA and *t*-butyl hydroperoxide are often used as oxidising agents in chemistry. Peroxides may also be formed during certain chemical reactions, such as ozonolysis, or when ether solvents are left exposed to air for long periods.

Hazards

Peroxides are potentially explosive. This may be caused by heating, by shock or by reaction with other chemicals. Hydrogen Peroxide may cause skin burns.

Precaution

Peroxides should be destroyed at the earliest instance. This is best achieved by treatment with a suitable reducing agent such as sodium sulfite. The literature should be consulted for specific cases.

Hydrogen peroxide may be catalytically decomposed to water and oxygen using certain transition metal salts such as MnO_2 (warning: can be vigorous).

t-Butyl hydroperoxide is one of the most commonly used peroxides in organic chemistry. Safety advice for this substance may be found in Gao, Y.; Hanson, R. M.; Klunder, J. M.; Ko, S. Y.; Masamune, H.; Sharpless, K. B. *J. Am. Chem. Soc.* **1987**, *109*, 5765.

The presence of peroxides can be detected using starch-iodide paper. A control test with the reagent should be carried out first.

Ether solvents, including diethyl ether, tetrahydrofuran and dioxane, that are stored for long periods should be tested for peroxides regularly. Solvents in such a condition should never be evaporated to dryness.

Peroxides should not be treated with strong acids; hydrogen peroxide should never be used with acetone in the presence of acids to avoid the formation of solid, explosive peroxides.

The following personal protective equipment (PPE) is to be used:

- Safety Glasses, Labcoat, Latex gloves, Long pants, Covered shoes

Peroxides must always be used in a well ventilated fume cupboard. If large quantities are being used, an additional blast shield should be employed.

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