

## Safe Working Procedure for Potassium Permanganate

Potassium permanganate,  $\text{KMnO}_4$ , is a powerful oxidizing agent. It is occasionally used as an oxidizing agent in organic chemistry, it is a useful starting material for other manganese compounds, as a titrant in analytical chemistry and it as a visualizing agent in TLC. It has some use as a topical antiseptic.

### Hazards

Potassium permanganate can react violently with a number of compounds. It vigorously reacts with hydrogen peroxide. These two chemicals should not be mixed.

$\text{KMnO}_4$  reacts vigorously with hydrochloric acid to generate toxic chlorine gas.

The combination of  $\text{KMnO}_4$  with concentrated sulfuric acid may form the explosive  $\text{Mn}_2\text{O}_7$ .

$\text{KMnO}_4$  reacts violently with diols, triols and many other oxidisable organic materials. It should never be mixed with ethylene glycol, glycerol or related compounds except as indicated under "precautions". The reaction with sugars and cellulose (e.g. paper) can be highly exothermic, leading to fire. The reaction with a couple of drops of glycerol can be seen here: <http://www.youtube.com/watch?v=80Q3GgeelVM&feature=fvwrel>

### Precautions

$\text{KMnO}_4$  must never be mixed with readily oxidisable materials (or  $\text{H}_2\text{O}_2$ ) except under controlled conditions and on an appropriate scale. A risk assessment must be completed beforehand.

PPE must be worn when handling this reagent: safety glasses, lab coat, long trousers and covered shoes. Gloves are recommended.

### Notes

Solutions of  $\text{KMnO}_4$  are sensitive to light. Such solutions should be kept in a brown glass bottle.

If the skin is exposed to  $\text{KMnO}_4$ , it will be stained brown (formation of  $\text{MnO}_2$ ). The effect is temporary and (on a small scale) confined to the surface.

Excess  $\text{KMnO}_4$  may be reduced to  $\text{MnO}_2$  by reaction with  $\text{MnSO}_4$  before disposal according to the correct procedure.

### Regulation

Potassium permanganate is regulated by the Central Narcotics Board. This chemical must be kept in a secure, locked location. All use of  $\text{KMnO}_4$  must be recorded (date, amount used, purpose of use). These records must be kept for two years.

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