

Safe Working Procedure for Metal Hydrides

Three metal hydrides are in common use. Sodium hydride (NaH) and potassium hydride (KH) are often used as strong bases. Calcium hydride (CaH₂) is often used as a drying agent. Sodium and potassium hydrides are supplied as suspensions in mineral oil (often 60%), while calcium hydride is supplied pure.

Hazards

All three of these metal hydrides will react violently with water and low molecular weight alcohols, releasing hydrogen. Sufficient heat can be released to cause fire.

Precautions

These hydrides must never be allowed to come into contact with water.

Potassium hydride is the most reactive and can catch fire in air, due to the moisture in air. KH should always be blanketed with inert gas.

Sodium hydride has reactivity with water that is similar to sodium metal. NaH can usually be handled with care in air for brief periods.

Calcium hydride is less reactive than the other two and may be handled with care in air for short periods.

Processes (reactions, solvent drying etc) involving these metal hydrides must always be under an atmosphere of an inert gas.

Reaction mixtures containing metal hydrides should be quenched cautiously, maintaining the atmosphere of inert gas.

Excess hydride should be cooled (0°C) and blanketed with a flow of inert gas before quenching. Hydrides can then be quenched by cautious dropwise addition of iso propanol

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

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

Metal hydrides must be handled in a well ventilated fume cupboard.

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