

Chemistry Department

Standard Operating Procedure

Title: Water Reactive Chemicals

Water sensitive chemicals are chemicals that react vigorously with moisture. The most common water sensitive chemicals include sodium, potassium, lithium metals and aluminum alkyls.

Decontamination procedures

Personnel: Wash hands and arms with soap and water immediately after handling water sensitive chemicals.

Area: Carefully clean work area after use.

Emergency procedure

Emergency procedures which address response actions to fires, explosions, spills, injury to staff, or the development of sign and symptom of overexposure must be developed. The procedures should address as a minimum the following:

Who to contact: (University police, and Office of Environmental Health and Safety, Principal investigator of the laboratory including evening phone number)

The location of all safety equipment (showers, spill equipment, eye wash, fire extinguishers, etc.)

The location and quantity of all water sensitive chemicals in the laboratory

The method used to alert personnel in nearby areas of potential hazards

Special first aid treatment required by the type of water sensitive chemicals handled in the laboratory

Eye protection

Eye protection in the form of safety glasses must be worn at all times when handling water sensitive chemicals. Ordinary (street) prescription glasses do not provide adequate protection. (Contrary to popular opinion these glasses cannot pass the rigorous test for industrial safety glasses.) Adequate safety glasses must meet the requirements of the American Standard Practice for Occupational and Educational Eye and Face Protection (ANSI Z.87. 1 1989) and must be equipped with side shields. Safety glasses with side

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shields do not provide adequate protection from splashes; therefore, when the potential for splash hazard exists other eye protection and/or face protection must be worn.

Eyewash

Where the eyes or body of any person may be exposed to water sensitive chemicals, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. Bottle type eyewash stations are not acceptable.

Fume hood

Many water sensitive chemicals will liberate hydrogen when they react with water. The use of a fume hood is recommended to prevent the buildup of combustible gases.

Glove (dry) box

A glove box may be used to handle water sensitive chemicals when a dry atmosphere is required.

Gloves

Gloves should be worn when handling water sensitive chemicals. Disposable latex or nitrile gloves provide adequate protection against accidental hand contact with small quantities of most laboratory chemicals. Lab workers should contact the department storeroom for advice on chemical resistant glove selection when direct or prolonged contact with hazardous chemicals is anticipated.

Hazard assessment

Hazard assessment of work involving water sensitive chemicals should address proper use and handling techniques, fire safety (including the need for Class D fire extinguishers), storage, water reactivity, and waste disposal issues.

Protective apparel

Lab coats, closed toed shoes and long sleeved clothing should be worn when handling water sensitive chemicals. Additional protective clothing should be worn if the possibility of skin contact is likely.

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Safety shielding

Safety shielding is required any time there is a risk of explosion, splash hazard or a highly exothermic reaction. All manipulations of water sensitive chemicals that pose this risk should occur in a fume hood with the sash in the lowest feasible position. Portable shields, which provide protection to all laboratory occupants, are acceptable.

Safety shower

A safety or drench shower should be available in a nearby location where the water sensitive chemical is used.

Signs and labels

Containers: All water reactive chemicals must be clearly labeled with the correct chemical name. Handwritten labels are acceptable; chemical formulas and structural formulas are not acceptable.

Special storage

Water sensitive chemicals should be stored in a cool and dry location. Keep water sensitive chemicals segregated from all other chemicals in the laboratory. Minimize the quantities of water sensitive chemicals stored in the laboratory.

Date all containers upon receipt. Potassium will form peroxides and superoxides when stored under oil at room temperature. Examine storage containers frequently. Dispose of any container that exhibits salt build up on its exterior. Dispose of all water sensitive chemicals whenever they are no longer required for current research.

Never return excess chemicals to the original container. Small amounts of impurities may cause a fire or explosion.

Special ventilation

Special ventilation is required if these materials are used outside of a fume hood. If your research does not permit the handling of water sensitive chemicals in a fume hood you must consult with the Principle Investigator about alternative ventilation.

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Spill response

Anticipate spills by having the appropriate clean up equipment on hand. The appropriate clean up supplies can be determined by consulting the material safety data sheet. This should occur prior to the use of any water sensitive chemicals. Spill control materials for water sensitive chemicals are designed to be inert and will not react with the reagent. Do not put water on the spill.

In the event of a spill alert personnel in the area that a spill has occurred. Do not attempt to handle a large spill of water sensitive chemicals. Turn off all ignition sources and vacate the laboratory immediately. Call for assistance.

- Office of Environmental Health & Safety 335-3041 or 911
- University Police 911
- This is a 24 hour service.

Remain on the scene, but at a safe distance, to receive and direct safety personnel when they arrive.

Waste disposal

All materials contaminated with water sensitive chemicals should be disposed of as hazardous waste. Wherever possible, attempt to design research in a manner that reduces the quantity of waste generated. Contact the chemistry department storeroom to dispose of wastes. See the Waste Disposal SOP for collection, storing, submitting and labeling instructions. These wastes may pose a flammability risk and should not remain in the laboratory overnight.