Lab Standard Operating Procedure:

**Strong Alkalines**

PI: Room & Building:

Department: Research Group:

Date: Pertains to Lab Protocol:

**DESCRIPTION**

An alkali is a basic, ionic salt of an alkali metal or alkaline earth metal element that dissolves in water. A strong alkali is an alkali that ionizes completely when dissolved in water. Chemicals that fall under this SOP (but are not limited to) include:

* Sodium hydroxide (CAS No. 1310-73-2)
* Potassium hydroxide (CAS No. 1310-58-3)
* Calcium hydroxide (CAS No. 1305-62-0)

**PROCEDURE**

Attach the experimental protocol(s) that involve the use of strong alkalines.

**POTENTIAL HAZARDS**

* Extremely corrosive (causes burns to any area of contact – skin, eyes, mucous membranes)
* Irritant (skin, eyes, and respiratory tract)
* Unlike acids, hydroxides do not coagulate protein which impedes penetration. Metal hydroxide may not be immediately painful during skin penetration, producing severe and slow-healing burns.

**ENGINEERING/VENTILATION CONTROLS**

All operations involving sodium hydroxide should be carried out in a chemical fume hood with the sash in the down position, between your chest and what you are handling in the hood.

* If the hood’s sash cannot be adjusted horizontally, protective eyewear is required (see “Required Personal Protective Equipment”)

**REQUIRED PERSONAL PROTECTIVE EQUIPMENT**

(Refer to your lab’s PPE Assessment Report, supplemented with information here)

* Chemical splash goggles. Face shield, optional.
  + Only applicable if not working in a fume hood or if the hood’s sash is not in the down position.
* Double nitrile, neoprene or latex gloves
  + Immediately replace with new gloves when contamination occurs.
* Chemical resistant apron/smock/lab coat (PE or PVC) that covers limbs
  + - Avoid using the traditional cotton-polyester white lab coat, which readily collects/absorbs compounds.
* Closed-toed, impervious footwear

**ADDITIONAL PRECAUTIONS**

* Avoid heat sources and moisture.
* Reaction with aluminum or magnesium generates flammable and potentially explosive hydrogen gas; reaction with nitromethane and nitrophenols produces shock-sensitive explosive salts.
* Do not mix with acids or organic materials.
* When mixing with water, always add caustics/alkalines slowly to the water and stir continuously. Never add water in limited quantities to solid hydroxides.

**DECONTAMINATION**

Wipe any residual sodium hydroxide off of balance after use. Neutralize contamination, as necessary. Regular or intermittent use of strong alkalines warrants on-site supplies – neutralizing powder or liquid, absorbent powder, personal protective equipment/garb. Also, see neutralizing powder in the spill clean-up kit located in your building.

* Note location here: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**SAFETY REFERENCES**

Additional chemical safety information, including MSDSs and other information, is available electronically as tools at [ehs.harvard.edu/programs/safe-chemical-work-practices](http://ehs.harvard.edu/programs/safe-chemical-work-practices).

**WASTE DISPOSAL**

Refer to the *Laboratory Waste Guide* posted at [ehs.harvard.edu/node/7699](http://ehs.harvard.edu/node/7699).

**EMERGENCY PROCEDURES**

(Refer to the [Emergency Response Guide](http://www.ehs.harvard.edu/programs/emergency-guidance) posted in your lab, supplemented with information here)

**Chemical Spill:**

* For small spills, follow chemical spill response guidelines above. Don protective clothing and carefully apply neutralization powder or liquid, whichever is most appropriate, to the spill. Allow time to neutralize, and then apply liquid absorbent pellets or powder.
* For a large spill, vacate the lab, deny further entry, and call EH&S for assistance.