

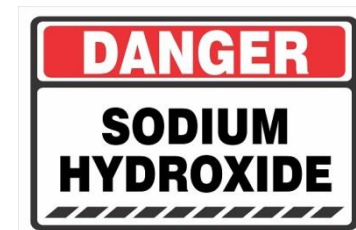
# Sodium Hydroxide Safety

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KREMESTI ENVIRONMENTAL CONSULTING

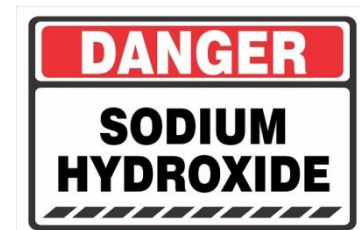


PASSION FOR CHEMISTRY



# Properties

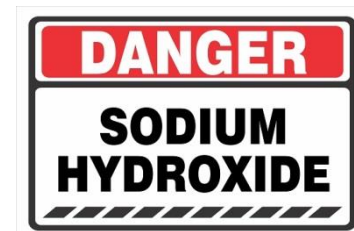
- Caustic
- Corrosive to skin (saponifies the fat in ur skin)
- Increases pH
- **Exothermic** dissolution in water
- Reacts violently with Acids
- Hygroscopic
- Reacts with  $\text{CO}_2$  in the air to form  $\text{Na}_2\text{CO}_3$
- Dissolves Glass (Silica)
- Solution freezes at  $15\text{ }^\circ\text{C}$
- Dissolves Aluminum to release  $\text{H}_2$



# Sodium Hydroxide Pellets

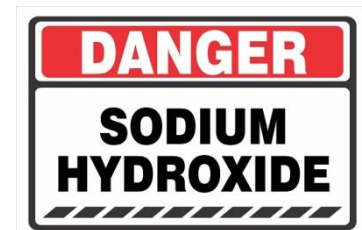


NaOH



# Uses on Sites

- Regeneration of the MBX
- pH adjustment of Effluent
- pH adjustment of the CCW system
- CO<sub>2</sub> capture in the soda lime filter of the Demin water tank
- With NaCl, NaOH solutions can regenerate sugar decolorization ion exchange columns

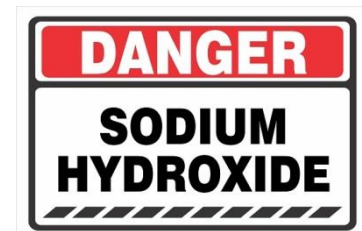


# Home Use

- Drain cleaner (dual action heat and saponification of fat)
- De-greaser
- Soap Making agent
- Some pretzels are dipped in a caustic solution before baking.

# Neutralization

- Add acidic agent slowly: Citric acid, dilute HCl or H<sub>2</sub>SO<sub>4</sub>
- NaHCO<sub>3</sub> is even safer (Sodium Bi Carbonate)



# Safety

- Full chemical safety gear including full face shield
- Rubber gloves OK
- In case of skin contact rinse with water or better yet Diphoterine<sup>®</sup>
- NaOH tanks can have **mercury** containing sludge at the bottom...



# Safety

## **CAUTION**

### **Toxic mercury vapour hazard in empty caustic tanks**

Many grades of caustic soda contain a significant amount of mercury which accumulates as a black sludge at the bottom of storage tanks. Mercury is volatile and its vapour extremely poisonous.

- A caustic tank requiring cleaning must be drained and completely isolated by disconnection.
- If mercury may be present in the tank it must be air purged immediately after caustic is drained and before entry.
- Before tank cleaning fill drained tank at least twice with water and drain slowly to reduce caustic concentration.
- Breathing apparatus or respirators must be worn by personnel entering the tank
- Follow all regulations for entering a confined space
- Wear suitable protective clothing before entering tank
- Any sludge removed from caustic tank must be kept in sealed plastic containers.





# Fun Facts: Tissue digestion

- Sodium hydroxide is used to digest tissues, such as in a process that was used with farm animals at one time. This process involved placing a carcass into a sealed chamber, then adding a mixture of sodium hydroxide and water (which breaks the chemical bonds that keep the flesh intact). This eventually turns the body into a liquid with coffee-like appearance, and the only solid that remains are bone hulls, which could be crushed easily.
- Sodium hydroxide is frequently used in the process of decomposing roadkill dumped in landfills by animal disposal contractors. Due to its low cost and availability, it has been used to dispose of corpses by criminals. Italian serial killer Leonarda Cianciulli ([La Saponificatrice](#) – The Soap Maker) used this chemical to turn dead bodies into soap. In Mexico, a man who worked for the drug cartels admitted disposing of 300 bodies with it.