

SODIUM HYDROXIDE

pH Control

Product Description

SODIUM HYDROXIDE is used in water-base muds as a source of hydroxyl ions to control pH. SODIUM HYDROXIDE, caustic, alkali and lye are all common names for sodium hydroxide (NaOH). It is a strong base which is extremely soluble in water and dissociates into sodium (Na) and hydroxyl (OH) ions in solution

Typical Physical Properties

Physical appearance	White beads, pellets, flakes or crystals
Specific gravity	2.13
Solubility	13.0
Flash Point	119 g/100 mL water

Application

SODIUM HYDROXIDE is used to maintain or increase pH. Increasing pH with SODIUM HYDROXIDE precipitates magnesium (Mg^{2+}) and suppresses calcium (Ca^{2+}) in high hardness waters such as seawater, reduces corrosion, and neutralizes acid gases such as carbon dioxide (CO_2) and hydrogen sulfide (H_2S).

Typical concentrations range from 0.25 to 4 lb/bbl (0.7 to 11.4 kg/m³) with treatments depending on water chemistry and type of drilling fluid. In seawater and waters containing buffering salts, a higher concentration of SODIUM HYDROXIDE is required. Gulf of Mexico seawater requires 1.5 to 2 lb/bbl (4.3 to 5.7 kg/m³) to precipitate all magnesium then convert the calcium to lime.

Advantages

- Widely available and an economic source of hydroxyl ions to control pH
- Concentrated chemical and very effective at small treatment levels
- Increases pH which reduces corrosion of steel exposed to drilling fluids
- Can be used in most drilling fluids

Limitations

- In high hardness brines such as $CaCl_2$, Williston, Michigan and Zechstein brines, SODIUM HYDROXIDE cannot be used to effectively raise the pH due to the high level of cations which combine with hydroxyl ions to precipitate hydroxides such as $Ca(OH)_2$ and $Mg(OH)_2$

Toxicity and Handling

Handle as an industrial chemical, wearing protective equipment and observing the precautions described in the Material Safety Data Sheet (MSDS).

WARNING! Avoid exposure and handle only when fully protected.

SODIUM HYDROXIDE is an extremely alkaline material and can cause severe burns to eyes, skin and respiratory tract, and may react violently with water or acids. Considerable heat energy is generated when SODIUM HYDROXIDE is mixed with water and care should be taken when mixing.

SODIUM HYDROXIDE should be added slowly to the mud system through a properly designed chemical barrel. Do not mix SODIUM HYDROXIDE with other chemicals or through the mud hopper. When using the chemical barrel, fill to the desired level with water then add dry SODIUM HYDROXIDE.

Packaging and Storage

SODIUM HYDROXIDE is packaged in 50-lb (22.7-kg), multi-wall, paper sacks with

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plastic liners. Other packaging includes fiberboard or steel drums of various sizes, as well as other sack sizes.

Store at room temperature in a dry, well-ventilated area. Keep in original container. Keep container closed. Keep away from heat, sparks and flames. Store away from incompatibles