Description

LIME is a high-purity calcium hydroxide having the chemical formula $Ca(OH)_2$.

Typical Properties

Appearance : White powder
pH (1% solution) : 12.3 - 12.5
Specific Gravity : 2.2

Features and Benefits

LIME is a common and an inexpensive source of soluble calcium for lime-base drilling fluids.

LIME is very effective in removing bicarbonate and carbonate contaminations from water-base drilling fluids.

The reactions are as follows:

$$Ca(OH)_2 + CO_3^{2-} \rightarrow CaCO_3 \downarrow + 2OH^-$$

$$Ca(OH)_2 + HCO_3^- \rightarrow CaCO_3 \downarrow + H_2O + OH^-$$

LIME increases viscosities and gel strength of (spud mud) for better hole cleaning. This is particularly an important issue in top hole drilling.

LIME activates fatty acid based primary emulsifiers in oil based drilling fluids by converting them to calcium soap emulsifier in situ.

LIME reduces corrosion rate by maintaining high pH.

Application

LIME is used as a calcium source in lime-base systems.

LIME is also utilized as flocculant to increase viscosity of spud mud.

LIME is used to activate primary emulsifier in oil-base drilling fluids.

LIME is added to treat carbonate and bicarbonate contaminations in water-base drilling fluids.

Limitations

LIME is not suitable for treatment of carbonate contamination in high pH systems due to its low solubility in this environment.

Treatment

In removal of carbonate contamination, treatment levels of LIME are determined depending on the concentration of ions to be removed as follows:

To treat bicarbonates;

Lime (lb/bbl) = $0.00021 \times F_w \times HCO_3^-$ (mg/l)

To treat carbonates;

Lime (lb/bbl) = $0.000425 \times F_w \times CO_3^{2-}$ (mg/l)

Where F_w is water fraction in the fluid.

In low lime fluid formulation, LIME concentration ranges from 0.3 to 1.0 lb/bbl (0.86 to 2.85 kg/m^3). Lime is normally added at concentrations of 5 to 10 lb/bb (14.3 to 28.5 kg/m^3) as the primary emulsifier activator in oil-base drilling fluids.

Packaging

LIME is supplied in 25 kg (55 lb) multi-wall paper sacks.

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