

FRANKLIN IRON & SULFUR STABILIZING AGENT A60

Hydrochloric acid treatments are used on older producing and injection wells to dissolve precipitated iron and scale from the well bore. Once the iron has been dissolved and the acid spends, the iron will re-precipitate in another location. Many times, this is deeper in the formation.

Iron stabilizing agents should always be used when acidizing formations containing iron minerals or when iron scale is present in the pipe. Even new casing and tubing has a considerable amount of “mill scale” present which will be dissolved in the acid.

The dissolved iron is in two stages, ferrous (II) and ferric (III). The iron remains in solution until the acid is spent and the pH begins to rise. At a pH of near 2, the iron that is in the ferric state will precipitate as ferric hydroxide, a slimy, gelatinous, insoluble mass. This mass can plug flow channels and reduce permeability.

A60 reducing agent added to acid can reduce ferric ions present to the more soluble ferrous state. While ferric hydroxide begins to precipitate from spent acid at a pH of 2, ferrous hydroxide is much more soluble and does not precipitate until a pH of about 7.7 is reached. Spent acid normally reaches a pH of around 6.

When H_2S is present, dissolved iron does not precipitate as ferric hydroxide, but will instead precipitate as sulfur and insoluble ferrous sulfide (FeS) as the acid spends. A60 will control sulfur, but will not prevent ferrous sulfide precipitation. When treating formations containing H_2S , complexing agent A46 should be used in combination with A60. This will effectively control both sulfur and FeS precipitations.

Normal concentrations of A60 in acid are 5 to 15 pounds per 1,000 gallons of acid depending on the concentration of iron present. Five pounds of A60 in 1,000 gallons of acid will stabilize 1,000 ppm ferric iron.

A60 is compatible with almost all other acidizing chemicals and is effective in BHST up to 400 degrees Fahrenheit.