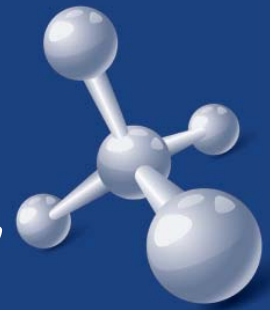


# TIOR-KOH<sup>®</sup>



## Process Mechanics for Maintaining Injectivity by Stabilizing Migrating and Swelling Clays

The Science of Enhanced Oil Recovery

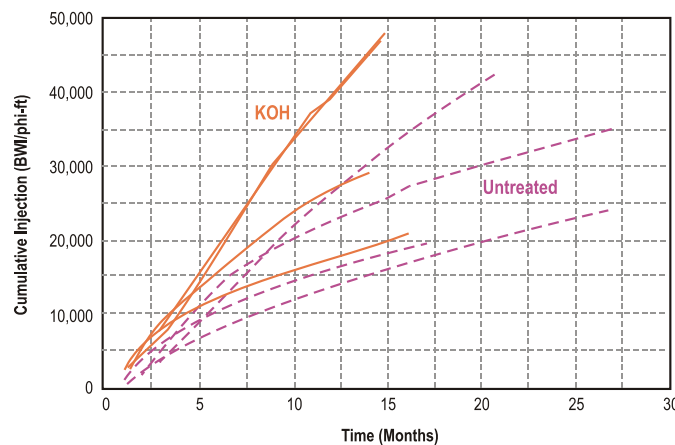
Many low permeability sandstone reservoirs contain clays that swell and migrate upon contact with fresh water. When this happens, injection of drive fluids are restricted and damage to the near wellbore area occurs. Thus, waterflood efficiency is greatly reduced and incremental oil recovery cost increases because oil production is directly proportional to the water injection rate. Manufacturing a synthetic brine for long-term injection is too costly, and cationic clay stabilization treatments are sacrificial - lasting only a short time before damage begins to occur.

The TIOR-KOH process reacts liquid potassium hydroxide with the near wellbore rock of the injection well to permanently stabilize the clays, rendering them immobile and non-swelling. In effect, the alkaline treatment increases the injection well radius, and allows the fresh water to penetrate deeper into the reservoir where reduced velocity does not cause clay migration.

Additionally, imbibition chemicals added continuously to the injection water work synergistically to further enhance water penetration into the tightest oil-bearing rock. TIORCO<sup>®</sup> 535 reduces the contact angle of injection water to the reservoir rock, permitting water to enter pore throats that are normally restricted to water intrusion. This allows for even more oil-bearing rock to be swept for improved recovery of incremental oil.

### TIOR-KOH

- TIOR-KOH<sup>®</sup> 845
- TIOR-KOH<sup>®</sup> 899



When plots of the same group of wells are normalized to account for differences in rock quality and pay interval, the wells treated with KOH show improved performance over untreated wells.