

ENERGY DEVELOPMENT PARTNERS

EOR Acid Treatment Technology

Proprietary EPA approved, environmentally safe chemical composition with H₃PO₄ (Phosphoric Composition PCC) is used for EOR treatment of hydrocarbon wells.

The present conventional acid treatment of wells uses the hydrochloric acid HCL for conventional Enhanced Oil treatment of hydrocarbon wells.

Our proprietary H₃PO₄ (Phosphoric Composition PCC) for Enhanced Oil recovery (EOR) treatment	Conventional Hydrochloric acid HCL method for Enhanced Oil recovery (EOR) treatment
The PCC penetration into formation around perforated zone is up to 10 and more meters and reaction time is less than reaction time of conventional acid treatment methods.	The conventional HCL penetration into formation around perforated zone is only up to 0.7 meter and reaction time is longer compared to our acid treatment method.
Our PCC composition reacts with CaCo ₃ , participates in Si formation, it does not hydrate the clay formations and prevent the clay formation from perforated zone clogging.	The conventional HCL hydrates the clay formations and clogs perforated zones.

Our PCC composition can be used at vertical, deviated and horizontal wells with an open end and cased bottom hole. Also it could be used for reservoirs with temperatures up to 135 0C(275 0F) and in conditions of the initial flooding.

The reaction rate of carbonate rocks formations and our patented PCC composition is much lower compared to reaction rate of carbonate rocks formations with hydrochloric-acid, even without adding any Retarders to PCC.

So the range of affected zone and stimulated region become wider and the domain of wormhole structure in the reservoir will be extended by using our PCC. Phosphoric acid dissolves slurries and precipitants in capillaries and will change the skin effect up to - 6 compared to skin effect of hydrochloric acid (about -3), increasing the void fractions in capillaries, creating more porosity in reservoir formations, enhancing the formations permeability through capillaries and improving the wells productivity.

Our innovative method of acid treatment never decreases the oil and gas productivity, it increases the wells productivity. Furthermore, our PCC acid treatment decreases the corrosive effect (up to 10 times) of metal casing and tubing compared to conventional hydrochloric acid treatment and drastically increasing the life time of wells metal parts.

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Below is a comparison of our innovative PCC Acid treatment method and Conventional Hydrochloric acid HCL treatment method in terms of increased wells productivity; averaged data are the result of statistic for 300 wells treated.

METHODS	PRODUCTIVITY CHANGE
Conventional (HCL) method, not always positive	-200% - +200%
Our H₃PO₄ (PCC) method, always positive	+150% - +300%
Inactive Dispersed System (Powder)	+200% - +600%