DOI: 10.1504/IJOGCT.2009.030679

Predicting tool for sulphate scale build-up around the wellbore in oilfield

A.S. Adesina Fadairo Related information1 Department of Petroleum Engineering, Covenant University, Km 10, Idiroko Road, Ota, Nigeria.

, Olugbenga Falode Related information2 Department of Petroleum Engineering, University of Ibadan, Ibadan, Nigeria

Abstract

Formation and deposition of scale in porous media due to extensive use of seawater for oil displacement and pressure maintenance is a problem that results in production decline and loss of billions of dollars to the petroleum industry yearly. A variety of models are presently being used in the oil industry for predicting scaling tendency and average scales precipitation inside the reservoir. These models assumed that all the occurring scale precipitation would cause formation damage near the wellbore region however, only a fraction of the precipitated scales escape through the pore spaces to render havoc to flow in the production string. This paper presents a new model based on existing thermodynamic models for predicting barium and strontium sulphate scale build-up rate around an oil production well during water flooding while accounting only for the fraction resulting into formation damage. The key operational and reservoir parameter which influence the magnitude of impairment by scale deposition are identified through the derivation of an analytical expression for the rate of scale build-up, assuming idealised flow conditions. The model is capable of predicting scale build-up rate and fraction of scale deposited in pore spaces at a particular radial distance from a wellbore during water injection. [Received: June 4, 2009; Accepted: October 10, 2009]

Keywords: modelling, oilfield scale, saturation, wellbore, permeability, porosity, water flooding, scale precipitation, scaling tendency, predictive tool, oil fields, sulphate scale build-up, seawater, petroleum industry, thermodynamics, oil production wells, pore spaces, water injection

International Journal of Oil, Gas and Coal Technology

Publication Cover

Print ISSN: 1753-3309 Online ISSN: 1753-3317

Most Cited

Relative permeability prediction considering complex pore geometry and wetting characteristics in carbonate reservoirs

The method for optimisation of gas compressors performance in gas storage systems

Geochemistry of Croatian superhigh-organic-sulphur Raša coal, imported low-S coal and bottom ash: their Se and trace metal fingerprints in seawater, clover, foliage and mushroom specimens

Three-dimensional pore networks and transport properties of a shale gas formation determined from focused ion beam serial imaging

Diamondoids: occurrence in fossil fuels, applications in petroleum exploration and fouling in petroleum production. A review paper

See More

Keep in touch:

Our Newsletter Visit us on Facebook Follow us on Twitter RSS Feeds Our Blog Join us on Google+