DTU Library

Functionalized Polyacrylamide Hydrogel For Temporary Oil and Gas Well Abandonment: Synthesize, Characterization, and Injectivity Survey

Movahedi, Hamed; Bovet, Nicolas; Poulsen, Henning F.

[Link back to DTU Orbit](#)

Functionalized Polyacrylamide Hydrogel For Temporary Oil and Gas Well Abandonment:

Synthesize, Characterization, and Injectivity Survey

Hamed Movahedi, Nicolas Bovet, Henning F. Poulsen

The primary objective of this work is to produce a unique variation of hydrogel specifically designed for the purpose of well plugging. Polyacrylamide was synthesized through radical polymerization and then the Hoffman rearrangement assisted partial amination of polyacrylamide. When heated within the desired temperature range, the polymer was crosslinked with glutaraldehyde to generate a hydrogel. The appropriate gelation concentrations were determined through rheological tests and gel time measurements. The gelation times ranged from 4 to 20 hours, suggesting these doses can be used for various injection methods into the porous formation to form the gel inside the porous media. The Dynamic CT scanning have been conducted for tracking polymer inside chalk core plugs during injection.

AARHUS UNIVERSITY   UNIVERSITY OF COPENHAGEN   DTU   GEUS   AALBORG UNIVERSITY DENMARK