Encapsulation of bentonite pellets for controlled downhole placement and sealing

Publieke samenvatting / Public summary

Aanleiding

Lately, research focusing on safe and durable P&A options identified bentonite as a promising seal for O&G wellbores. The advantages of using natural downhole materials over cement are their long-term sealing capacities and their stability under downhole conditions. The downhole placement of bentonite is generally expected to require less expensive placement equipment, lower material costs and monitoring. However, when placing swelling clays downhole the immediate swelling of this material as soon as it gets in contacts with water must be prevented. Although bentonite plugging is a common practice in other domains, like water wells and nuclear waste disposal and its application for O&G has been demonstrated in the field, innovations with respect to placement, i.e. delaying the swelling by coatings or tailored wellbore fluids which could retard the swelling are required for an implementation of this technology.

Doelstelling

The project will demonstrate the feasibility to control the start and progress of bentonite swelling by encapsulation of bentonite pellets with a polymer coating. It aims at developing a coating for bentonite pellets, a coating method and defined placement options to create a natural wellbore plug for depths of at least 2500 meters.

Korte omschrijving

The study will focus on the following research questions: - What are the chemical and operational

Projectinformatie / Project information

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Algemene informatie / General information

Penvoerder / Secretariat
TNO

Publicaties en materialen / Publications and attachments

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  Eindrapport Encapsulation of Bentonites (TKI2018-06-GE)

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requirements for a bentonite coating? - Which candidate bio-organic polymers and synthetic polymers are available and affordable? - What dissolvement properties do the polymer materials have in the well bore fluids at wellbore temperatures? - Is the resistance to flow induced wear sufficient to facilitate downhole pumping through tubing? - Is encapsulation sufficient or are other additives required to control the swelling timing? - How can wellbore fluid properties support the prevention of instantaneous swelling of bentonites? - How can the coating be placed on the pellets in a simple but effective manner?

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.
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