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Smart low weight emulsifiers for efficient CoI_2 utilization in enhanced oil recovery

Bjørn Kvamme and **Khadijeh Qorbani**
University of Bergen, Norway

Worldwide there are huge amounts of methane trapped in water as hydrate. These ice-like hydrate crystals contains up to 14% methane in a highly concentrated form. Unlike conventional oil and gas, hydrates are spread all over the world in permafrost region or deep offshore sediments. Many countries depend on import of fossil fuel and in many cases on various qualities of contaminating coal. Simple and inexpensive ways to produce these hydrates are available and in this work we demonstrate by state of the art reservoir modeling of some of these production methods. This includes pressure reduction as well as replacement of CH_4 hydrate by CO_2 hydrate. The latter option is discussed in more details since it represents an interesting concept for CO_2 utilization and safe long terms storage of CO_2. Injection of pure CO_2 in natural gas hydrates involves low permeability and rapid formation of new hydrate than can block the sediments. Various ways to modify the concept by addition of other gases as well as environmentally friendly surfactants are discussed. Results from reservoir simulations related to real hydrate reservoirs are presented. These hydrate reservoirs span the range from shallow hydrate reservoir in the Barents Sea to very deep reservoirs offshore Taiwan.

Biography

Bjørn Kvamme has obtained his MSc in Chemical Engineering (1981) and PhD in Chemical Engineering (1984) from the Norwegian University of Technology and Natural Sciences. After a short period with SINTEF and two years at Bergen University College, he was appointed as full Professor in 1987 and started education of MSc and PhD in Process Technology in Telemark. He is appointed as a Professor in Gas Processing at the Department of Physics, University of Bergen in March 2000. He is the author/co-author of 445 publications during last 15 years, of which 154 are in good international scientific journals. He has 2526 citations as per Feb 1, 2018, and has presented numerous papers at international conferences.

bjorn.kvamme@uib.no

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