

# Synthesis and evaluation of new kinetic methane hydrate inhibitors based on waterborne polyurethane

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## Abstract

© SGEM2018. Formation of gas hydrates is a problem in the petroleum industry where the gas hydrates are responsible for the blockage of flow lines, valves and well heads, thereby causing great loss of production and other severe safety hazards to the oil and gas industry. This topic is the most challenging subject in flow assurance problems in oil and gas industry. Kinetic hydrate inhibitors (KHIs) are water-soluble polymers that are used to prevent gas hydrate blockages and they have been used in the field successfully. In this study we want to introduce a promising and powerful class of KHI based on waterborne polyurethane. The hydrate inhibition performances of KHIs were assessed in a high-pressure autoclave cell through two kinds of onset times of hydrate formation: the time when hydrate crystals are initially observed by naked eyes, and the time when rapid and continuous dropping of system pressure begins. The results demonstrated the best performance of these inhibitors in delay induction time (11-24 times) and reduce hydrate growth rate (2.5 times).

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## Keywords

Flow assurance, Kinetic hydrate inhibitors, Methane hydrate, Waterborne polyurethane

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