

Hydrate-Phobic Surface Treatment for Deposition Prevention

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Cost saving strategies employed by offshore operations tend towards the controlled formation of hydrates in the line. While bulk formation and subsequent agglomeration may be chemically controlled, deposition on the pipe walls represent a hazard for long-term operation at these conditions due to a stenosis effect. Robust “hydrate-phobic” coatings that have the potential to be applied to both new and existing pipelines are technologies that are attractive for advanced hydrate deposition mitigation strategies. This work applies an experimental multiscale approach to study a hydrate-phobic surface treatment, which has the potential to mitigate hydrate deposition in subsea flowlines. Gas hydrate experiments are conducted at high pressure, low temperature conditions on bench-scale and interfacial apparatuses (micromechanical force apparatus and rocking cells) and a lab-scale flowloop. Each of these shows the coating’s effect on hydrate nucleation, adhesion, and growth as well as overall fluid transportability through visual observations and growth calculations in oil-continuous phase systems.