

## **Evaluating the Hydrate Anti-Agglomerant Characteristics of Butyl Glycol Ether (BGE)**

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To overcome the high dosages of Thermodynamic hydrate inhibitors (THIs), the injection of low dosage hydrate inhibitors (LDHIs) is one of the economically efficient approaches to control the hydrate blockages in subsea oil and gas pipelines. In this direction, we study the LDHI (anti-agglomerant) properties of butyl glycol ether (BGE). Due to its surfactant-like properties, we evaluate the adsorption behavior of BGE on cyclopentane hydrate crystals using a benchtop micromechanical force (MMF) apparatus and adsorption on water-oil interface through interfacial Tensiometer. In addition, the methane hydrate anti-agglomerating behavior of BGE was evaluated through motor torque (resistance-to-flow) measurements employing a high-pressure visual autoclave (HPVA). The results obtained through Tensiometer indicate a strong surface-active tendency of BGE, whereby the oil-water Interfacial tension (IFT) was appeared to be affected significantly (>50% reduction in the IFT compare to baseline) with 1 wt% BGE (0.085 mol/L) in water. The MMF results showed the unusual hydrate morphology in the presence of BGE. Moreover HPVA results reveal that the addition of BGE promoted the hydrate growth kinetics, however, the corresponding torque data indicated a strong anti-agglomerant features of BGE. Further to this, we compared the efficacy of BGE with under-inhibited dosages of mono-ethylene glycol (5-10 wt%). Our findings may offer valuable insights into the development of new LDHI chemistries.