

## Combining Ionic Liquids with Polymers for Inhibiting Gas Hydrate Formation

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The problem of hydrate blockage of flow channels has been of major importance to the energy industry since the discovery of hydrates in gas pipelines. Ionic liquids (ILs) has attracted great attention in oil industry because they can inhibit gas hydrate formation. In this work, we study the concept of combining ILs with polymer inhibitors to more effectively inhibit methane hydrate formation. The new inhibitors extended the induction time and decreased the growth rate of the hydrate. using alone IL Rather than the effect was maximized when IL was combined with polymer. The induction times for [EMIM][BF<sub>4</sub>] + PVCap, [BMP][BF<sub>4</sub>] + PVCap, and [HEMP][BF<sub>4</sub>] + PVCap at 0.5 wt% of IL and 0.5 wt% of polymer were 120.3, 65.8, and 184.9 min. In all cases, the kinetic inhibition effect was enhanced when compared to that of each pure IL. ILs is expected to be a promising methane hydrate inhibitor.