

Study on Gas Hydrate Inhibition based on Ionic Liquids

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Ionic liquids are combined with a polymer kinetic hydrate inhibitor for methane hydrate inhibition. The inhibition effects of the mixtures consisting of poly(N-vinylcaprolactam) (PVCap) and ionic liquids such as N-ethyl-N-methylimidazolium tetrafluoroborate ([EMIM][BF₄]), N-butyl-N-methylpyrrolidinium tetrafluoroborate([HEMP][BF₄]) were investigated.[1] The induction times for [EMIM][BF₄] + PVCap, [BMP][BF₄] + PVCap, and [HEMP][BF₄] + PVCap at 0.5wt% of IL and 0.5wt% of polymer were 120.3, 65.8 and 184.9 min, respectively.[2] In particular, the inhibitor including [HEMP][BF₄] enormously renew induction time and decreased hydrate growth rate by forming hydrogen bonding between ionic liquid and water molecules.[3] It was found that all ionic liquids synthesized in this study are powerful synergists for the standard polymer inhibitor.