Ionic Liquids Induced Thermodynamic and Kinetic Inhibitions on Gas Hydrate Formation

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In the current era of high oil prices, natural gas hydrates became the possible substitutes for fossil fuel energy. This process of developing oil and gas fields is open to risks of pipeline explosions that are extensive to recover. Therefore, the development of the hydrate inhibitor became imperative to find the solution for the pipeline explosion. In this research, we report the concept of combining ionic liquids (ILs) with polymer inhibitors to more effectively inhibit CH_4 and CO_2 gas hydrate formation. ILs was studied as thermodynamic hydrate inhibitor (THI) for phase equilibrium measurement and as kinetic hydrate inhibitor (KHI) for induction time. Results showed that ILs possessed more inhibitory characteristics than that of pure CH_4 and CO_2 gas hydrates. In conclusion, ILs will be an effective gas hydrate inhibitor that can facilitate the securing of vast amount of energy resources.