Effect of tetrabutyl phosphonium bromide in the formation of methane hydrates

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Millions of cubic feet of natural gas, composed mainly of methane, are burned annually in Mexico as surplus form the off-shore process in the production platforms. The recovery of a porcentage from that gas would imply am impressive energy saving and a reduction of emissions of greenhouse gases to the atmosphere. The hydrate technology is proposed as an option of capture and recovery of methane.

The present work consists of the experimental formation and dissociation of methane hydrates in the presence of an ionic liquid (tetrabutyl phosphonium bromide)that favors the capture of gas. The hydrate-water-gas phase equilibrium is the point at wich a methane hydrtae can be formed. The system under study was CH_4 + H_2, in the presence of a promoter: tetrabutyl phosphonium bromide, with compositions of 0.99%, 5%, 9%, and 20 % mass in the aquous phase.

The experimental data of this work, allowed to evaluate the favorable effect of tetrabutyl phosphonium bromide on the formation of methane hydrates, the influence of the concentration of the promoter, the variation of the introcution time and wheter the hydrates formed with the promoted trap can trap the same amount of gas than a pure methane hydrate.