

Hydrate-based CO<sub>2</sub> separation from flue gas mixture using synergy effect of cyclopentane and tetra-n-butyl ammonium brommide

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In this study, the CO<sub>2</sub> separation using gas hydrate formation from flue gas mixture was investigated. In order to improve the efficiency of separation progress, we used the synergy effect of cyclopentane and tetra-n-butyl ammonium brommide. The measured ratios of CP with TBAB solution fixed concentration were 0, 3, 5, 7, 10 wt% and pressure range were 10, 20, 30, 40, 50 bar. And we reported the change of induction time and gas absorption with CP/TBAB solution ratios. Also, to confirm the efficiency of gas separation, split fraction and separation factor was calculated using the data of gas absorption and gas composition.

Equilibrium condition was significantly milder than pure hydrate state, but there were no remarkable differences dependent on CP/TBAB solution ratio. And there was no induction time at the formation of TBAB solution and CP/TBAB solution, the induction time with only conjunction of CP was 2400s. Gas absorption increased according to the increment of the ratios of CP/TBAB solution. and split fraction was increased as higher CP/TBAB ratio but separation factor was decreased.