A study on selective separation of CO_2 using gas hydrate formation

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As a method for selective separation of CO_2 from the flue gas which has low CO_2 composition, this study was performed on how to use gas hydrate formation. In particular, using as an additive TBAB (Tetra-n-butyl ammonium bromide), the degree of relaxation of thermodynamic phase equilibrium and the selection of the gas entrapment was investigated. Then, we presented a multi-stage process on the basis of the results of these study to obtain high purity CO_2.

We confirmed the equilibrium conditions of mild temperature conditions of more than 284K of 10,20,30,40,50 bar pressure. And we were able to know that the composition of CO_2 increased compared to composition of N_2 entrapped in TBAB semi-clathrate, the lower pressure at analysis of gas composition at each pressure. In addition, we tried to check the presence of structure of the cage $5^{12}6^3$ which is conformed at TBAB semi-clathrate through Raman spectroscopy, the flowsheeting has designated a process that takes into account the aspects of economic efficiency.