

Heat of regeneration in alkanolamine-CO₂ system with DSC

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It is important to reduce CO₂ emission from flue gases for controlling of the global warming problem. The absorption of acid gases by chemical solvents is the most mature method and suitable for large quantities of gas treating. Most regeneration processes using chemical solvent have consumed 50~80% of for absorption process energy. In recent, high efficient absorbents were developed by many reseachere to reduce regeneration energy in absorption process.

In this study, five alkanol amine aqueous solutions[MEA, AMP, MDEA, KIER-C3, AMP/KIER-C3 (KAC3-1)] were used for CO₂ absorption to investigate regeneration heat by TGA-DSC analysis. The regeneration heat of KIER-C3 solution was 310.8~196.9 kcal/kg-CO₂, so it was 107.1~165.2 kcal/kg-CO₂ lower than that of MEA solution. Aqueous KIER C-3 solution was approximately 30% lower than that of MEA. Also regeneration heat of CO₂ loaded aqueous blends AMP/KIER-C3 (KAC3-1) was 344.1~311.4 kcal/kg-CO₂ and these values are still superior than that of MEA.