

Biogas Separation, Alcohol Amine Solutions

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Abstract : Biogas, which is a valuable renewable energy source, can be produced by anaerobic fermentation of agricultural waste, manure, municipal waste, plant material, sewage, green waste, or food waste. It is composed of methane (CH₄) and carbon dioxide (CO₂) but also contains significant quantities of undesirable compounds such as hydrogen sulfide (H₂S), ammonia (NH₃), and siloxanes. Since typical raw biogas contains 25–45% CO₂, The requirements for biogas quality depend on its further application. Before biogas is being used more efficiently, CO₂ should be removed. One of the existing options for biogas separation technologies is based on chemical absorbents, in particular, mono-, di- and tri-alcohol amine solutions. Such amine solutions have been applied as highly efficient CO₂ capturing agents. The benchmark in this experiment is N-methyldiethanolamine (MDEA) with piperazine (PZ) as an activator, from CO₂ absorption Isotherm curve, optimization conditions are collected, such as activator percentage, temperature etc. This experiment makes new alcohol amines, which could have the same CO₂ absorbing ability as activated MDEA, using glycidol as one of reactant, the result is quite satisfying.

Keywords : biogas, CO₂, MDEA, separation

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020