

Abstract

Effective CO₂ capture techniques are needed due to rising human CO₂ emissions and the effects of climate change. In this study, we propose a low-cost and environmentally friendly method for CO₂ removal that makes use of TEAHSO₄ ionic liquid. The potential use of alkylammonium derivatives, particularly triethylammonium hydrogen sulfate (TEA.HSO₄), for carbon capture systems was examined. When triethyl amine reacts with 5M sulfuric acid under cold anhydrous conditions it produces triethylammonium hydrogen sulphate ionic liquid. Analytical method, such as FTIR, was used to establish the chemical composition and purity of TEA.HSO₄. A pressure vessel was used to assess TEA.HSO₄ ability to absorb carbon. The findings showed that TEA.HSO₄ had significant capacity and selection for CO₂ absorption, making him a compelling candidate for carbon dioxide capture applications.