

Adsorption of carbon dioxide onto amine-modified acrylic ester polymer support with different pore distribution

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In this study, PMMA supports and amine additives were investigated to adsorb CO₂. PMMA supports were fabricated using different ratio of pore forming agents(porogen) to control the specific surface area(BET), pore volume and distribution. Supported amine sorbents were prepared by physical(wet) impregnation of PMMA supports with tetraethylenepentamine (TEPA) and studied for post-combustion CO₂ capture purposes in the equilibrium adsorption isotherms and thermal gravimetric analysis (TGA). Toluene and xylene are used for porogens. The more the amount of toluene as porogen increased, the more the average pore diameter decreased. The characteristic of commercial porous acrylic ester resin, HP-2MG is similar with fabricated PMMA support added toluene 50% which has mesopore structure. Both of the analysis method showed that mesopore structure has a advantageous over the other structure: micropore and macropore. Desorption energy was measured by Temperature programmed desorption (TPD).