Studies of polymeric carbon dioxide sorbents by crosslinking reaction of Polyethyleneimine

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Because of the global concern over rising atmospheric temperatures, the recent literature has shown that there is a keen interest in developing materials and processes that can efficiently and economically capture and isolate the effluent CO_2.

In this study, novel carbon dioxide adsorbents were prepared as two methods by crosslinking reaction of polyethyleneimine(PEI) and PEGDE(Poly(ethylene glycol) diglycidyl ether). One adsorbents were directly prepared by crosslinking reaction of PEI and PEGDE with various ratio. Another adsorbents were prepared by impregnation of crosslinked polymeric adsorbent with AEROSIL. AEROSIL was used for prevention of amine elution from crosslinked PEI, and ease of compounding with resin. The carbon dioxide adsorption capacities of the two types of crosslinked PEI was investigated by thermogravimetry analysis (TGA). The CO_2 adsorption capacity of directly crosslinked PEI reaches to 186.78mg/g, and impregnated crosslinked PEI didn't reaches to 100mg/g. It is assumed that limitation of amine groups in AEROSIL. The objective of this research is to examine novel chemical adsorbents of carbon dioxide.