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SYNTHESIS, CHARACTERIZATION AND CO₂ SORPTION CAPACITY MEASUREMENTS OF SELECTED IONIC LIQUID POLYMERS

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Abstract. Ionic liquids (ILs) technology has been emerged as the most prominent approach for the encapsulation of CO₂ from flue gases, which is an important phenomena in oil & natural gas industry during the gas sweetening process. The remarkable performance of IL polymers for the CO₂ capture provided new opportunities to upgrade this technology in recent years. Therefore, in the present study, we have prepared different IL polymers namely poly(1-vinylimidazole), poly(1-vinyl-3-ethylimidazolium bromide), poly(1-vinyl-3-ethylimidazolium bis (trifluoro methylsulfonyl))imide and zeolite incorporated poly(1-vinyl-3-ethylimidazolium bis (trifluoro methylsulfonyl))imide materials and evaluated their relative efficiency for the separation of CO₂. The synthesized IL polymers were characterized by FT-IR, FE-SEM and EDX. The CO₂ sorption experiments were conducted to evaluate the efficiency of synthesized IL polymers using gas sorption cell. The results revealed that, the IL-zeolite polymer has adsorbed highest amount of CO₂ and recorded the highest pressure drop compared to other polymer ionic liquid and monomer ionic liquid materials.