Carbon dioxide absorption by blend of ionic liquids and sterically hindered amine

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The present work is a study to apply ionic liquids which are proposed as new CO_2 capturing absorbents for flue gas emitted from coal-fired power plant. In this work, [emim][Tf_2N] is selected as main ionic liquid due to its high absorption capacity. In order to increase absorption rate and decrease viscosity, [emim][Tf_2N] is mixed with sterically hindered amine solution. The experiment is carried out under different CO_2 partial pressure ranging from 2.5 kPa to 101.3 kPa between 313 and 353 K. A small size reactor (50 ml) is used with a NDIR real-time gas analyzer. 30 wt% monoethanolamine (MEA) solution was also tested as a reference absorbent. CO_2 loading is cross-checked by TOC (total organic carbon) analysis. It is shown that blending ionic liquids and amine solution creates a synergetic effect than using only ionic liquids.