

Prediction of Flow Patterns and Phase Equilibria for Captured Carbon Dioxide Streams in CCS Process

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In the carbon dioxide capture and transport process, the captured carbon dioxide streams from flue gas contain various level of impurities. Some impurities such as nitrogen, Oxygen, methane, NO_x and SO_x affects the flow patterns and phase equilibria of captured carbon dioxide streams. For the success of design for carbon dioxide transport process, appropriate prediction methods of flow patterns and phase equilibria are important. In this study, GERG-2008 equation of state, shows accuracy prediction for carbon dioxide mixture, and the Baker map are used for prediction of phase equilibria for mixture of carbon dioxide and impurities and flow patterns for horizontal two-phase flow, respectively. The calculated properties of various condition of captured carbon dioxide streams using these methods are compared with other literature data. The program using these prediction method for captured carbon dioxide stream is implemented in visual C++ . This study is expected to provide guidelines for design of carbon dioxide transport process.