

Comparison of Properties Calculation Methods for Design of Carbon Dioxide Transportation

Doo Ho Lee^S, Byeong Soo Shin, Sung Hyun Kim and Jeong Won Kang^C
Department of Chemical and Biological Engineering, Korea University, Seoul, Korea
jwkang@korea.ac.kr

Process simulation tools are widely used for the design of carbon dioxide capture and transportation processes. Appropriate selection of calculation methods and proper use of parameters are crucial for the success of design for such processes. Flue gas from various source contain different level of impurities in carbon dioxide streams. Impurities such as nitrogen, oxygen, methane, NO_x and SO_x affects the properties and phase equilibrium of carbon dioxide streams. In this study, comparison of performances in calculations for properties and phase equilibrium has been investigated for various equation of state models such as cubic, SAFT and GERG. Especially, VLE calculation for system containing sulfur dioxide and nitric oxide was highlighted due to limited study for these systems. For several systems, suggested binary interaction parameters are reported for use in the commercial simulation software such as Aspen Plus. This evaluation study is expected to provide guidelines for establishing thermodynamic package for design of carbon dioxide transport processes.