

Online monitoring system for MEA-CO₂ solution using FT-IR

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MEA aqueous solution has been widely used for the CO₂ capture process where MEA reacts with CO₂ and water, producing ionic components. In long-term operation of the process, some problems can be caused such as degradation of the solvent and corrosion of the equipment that give the process unstable. Thus, development of online monitoring method is required to cope with the situation by introducing processes of make-up or/and reclaimer. Recent advances of Fourier Transform Infrared (FT-IR) spectroscopy technique enable the MEA aqueous solution to be quantitatively analyzed. In this work, MEA concentration and CO₂ loading amount in the solution are determined using the FT-IR spectroscopy. Standard solutions for calibration method are prepared, varying MEA concentrations from 10 to 50 wt% and CO₂ loading amounts from 0.1 to 0.5 moles of CO₂ per mole of MEA at a fixed temperature. Partial least square regression method is employed to establish the quantitative analysis model.