High pressure phase behavior of CO in butyraldehydes : n-butyraldehyde, isobutyraldehyde

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The solubility of CO in two butyraldehydes which contain n-butyraldehyde and isobutyraldehyde was measured for hydroformylation of propylene. The solubility of CO was determined by measuring the bubble point pressure at the temperature ranges from 303.15 to 373.15 K in 10 K intervals and at pressure up to 89 MPa. Also, the measured data were correlated with the PR-EoS (Peng-Robinson equation of state) incorporated with the conventional van der Waals one fluid mixing rule. As a result, the calculated data were comparatively well corresponded to the experimental results and the solubility of CO was observed to increase with increasing pressure and temperature. Moreover, the results also show that the iso form, isobutyraldehyde, has better CO solubility than the n form, n-butyraldehyde. It implies that the CO solubility is affected by the polarity.