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The Gasification of Acetone via Partial Oxidation in Supercritical Water

Authors : Shyh-Ming Chern, Kai-Ting Hsieh

Abstract : Organic solvents find various applications in many industrial sectors and laboratories as dilution solvents, dispersion solvents, cleaners and even lubricants. Millions of tons of Spent Organic Solvents (SOS) are generated each year worldwide, prompting the need for more efficient, cleaner and safer methods for the treatment and resource recovery of SOS. As a result, acetone, selected as a model compound for SOS, was gasified in supercritical water to assess the feasibility of resource recovery of SOS by means of supercritical water processes. Experiments were conducted with an autoclave reactor. Gaseous product is mainly consists of H2, CO, CO2 and CH4. The effects of three major operating parameters, the reaction temperature, from 673 to 773K, the dosage of oxidizing agent, from 0.3 to 0.5 stoichiometric oxygen, and the concentration of acetone in the feed, 0.1 and 0.2M, on the product gas composition, yield and heating value were evaluated with the water density fixed at about 0.188g/ml.

Keywords : acetone, gasification, SCW, supercritical water
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