

Gasification of isooctane in supercritical water for fuel cells

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The gasification of isooctane, a model compound of gasoline, was carried out in supercritical water to produce hydrogen in a continuously operated tubular reactor. The influences of feed inlet temperature, residence time, reactor temperature, feed concentration and oxidant concentration were examined in detail at a fixed pressure of 25 MPa. Hydrogen peroxide was used as the oxidant. The major components of the produced gas were H₂, CH₄ and CO₂ and the minor components of the produced gas were CO and C₂H₆. As residence time, isooctane concentration, and reactor temperature increased, H₂, CH₄, and CO₂ gas yield increased while CO gas yield did not change much. Possible reaction pathways at each experimental condition are presented.