

LOW CO₂ EMISSION REFORMING PROCESSES FOR HYDROGEN GENERATION FROM ISO-OCTANE

SWAPNIL P. MAHAJAN^a, GANESH R. KALE^b AND S. P. KODOLIKAR^a

^a Dept. of Chemical Engineering, Sinhgad College of Engineering, Pune, India.

^b CEPD Division, National Chemical Laboratory, Pune-411008, India.

Abstract

A thermodynamic analysis of iso-octane as feed hydrocarbon for steam reforming, dry reforming, autothermal reforming and dry autothermal reforming processes for temperature range 450 – 950 °C at 1 bar pressure under analogous operating conditions was done using Gibbs free energy minimization algorithm in HSC Chemistry. The trends in product distribution pattern and process enthalpies obtained in these processes mainly consisting of H₂, CO, CO₂, H₂O, CH₄ and C were compared. Dry autothermal reforming was identified to be the most interesting process for yielding better hydrogen/syngas, utilizing CO₂ with lower yield of undesired products like coke, water and methane.

Keywords : Iso-octane reforming; dry reforming; syngas production; thermodynamic modeling; CO₂ reforming; dry autothermal reforming