

**REACTION KINETICS OF THE CATALYTIC COMBUSTION OF LIGHT
HYDROCARBONS (ETHYLENE) IN FIXED BED REACTOR.**

S. DOUVARTZIDES, N. GEORGAKAKIS and P. TSIAKARAS

*Department of Mechanical and Industrial Engineering, University of Thessalia,
Pedion Areos, Athens Ave., 383 34, Volos, Greece.*

ABSTRACT

The catalytic combustion of ethylene was studied over Pt/ γ -Al₂O₃ catalyst particles in a fixed bed continuous flow reactor at atmospheric total pressure and at very low ethylene concentrations (i.e. 10⁻⁴ bar) within a temperature range of 200-250⁰ C. The catalytic activity of Pt/ γ -Al₂O₃ was examined and the reaction rate equation was derived in order to model the overall ethylene combustion reaction. The experimental results revealed that a Langmuir-Hinselwood adsorption type mechanism takes place for both ethylene and oxygen for the same types of the catalytically active sites of the catalyst particles. The proposed kinetic model was found in good agreement with the experimental results.