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Kinetics of Oxidative Coupling of Methane over Na/BaTiO₃/MgO Catalyst: Mechanistic Aspects

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The kinetics of oxidative coupling of methane reaction over a Na/BaTiO₃/MgO catalyst was studied under differential conditions in a fixed bed flow reactor. The experiments were carried out at 725, 775 and 825°C. Methane and oxygen partial pressures in the reactor were varied from 0.05 to 0.92 and 0.05 to 0.17 atm respectively with the total pressure of 1 atm for all reactions. Using molecular point of view the semi-mechanistic reaction rate equations for C₂H₆ (ethane) formation and CH₄ (methane) conversion rates have been proposed. The approximate total carbon oxides formation rates have also been deduced intuitively. The parameter 'n' was introduced that shows the portion of the reaction, which produces carbon oxides. After investigating some mechanistic approaches one of them was selected as the best mechanism.

Keywords: [OCM](#), [Oxidative coupling](#), [Methane](#), [Reaction rate](#), [Reaction mechanism](#), [Kinetic model](#)

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