DETAILED KINETIC MECHANISM OF METHANE OXIDATION AND COMBUSTION IN THE PRESENCE OF SULPHUR DIOXIDE

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Abstract: A detailed kinetic mechanism of methane oxidation and combustion in the presence of sulfur dioxide SO_2 is developed. The mechanism is validated on the direct experimental data on the effect of SO_2 on the kinetics of low-temperature oxidation of CH_4 and indirect experimental data on the propagation of laminar flame in methane–oxygen mixtures diluted with nitrogen. It is shown that in the low-temperature oxidation of methane, sulfur dioxide acts as a promoter. Numerical simulation of laminar flame propagation in the CH_4–O_2–SO_2 mixtures of different compositions revealed the inhibiting effect of sulfur dioxide.

Keywords: methane; sulphur dioxide; detailed kinetic mechanism; volumetric reaction; flame propagation; inhibitor; promoter

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