

Catalytic Combustion of LPG and VOCs in the Large Scale Catalytic Combustor

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A large scale catalytic combustor has been experimentally studied to effectively utilize the combustion heat of liquified petroleum gas (LPG) and/or the high-concentration volatile organic compounds (VOCs) generated in the industrial process. A perforated plate was installed within the catalytic combustor to make reactive gases uniformly distributed over honeycomb type catalysts. The device circulating the combustion gas was also adopted to investigate the inhibitive effect of CO₂ and H₂O on the reaction rate. The catalytic combustion of LPG over the honeycomb catalyst in the large scale catalytic combustor was significantly influenced by the inlet temperature, the flow rate of the reaction gas and the circulation ratio of combustion gas. The reaction rate of LPG over honeycomb catalyst decreased with increasing flow rate of reaction gas at the constant LPG flow rate. It suggests that the mass transfer resistance of LPG at the honeycomb catalyst surface can not be ignored and it should be importantly considered in designing the large scale catalytic combustor.