

Instytut Inżynierii Chemicznej

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Experimental investigations of the influence of radial gas mixing in an inert ceramic foam bed on thermal combustion of lean methane-air mixtures

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The paper discusses the application possibilities of ceramic foam in a thermal combustion process of a lean methane-air mixture. The experiments were done in a ceramic foam bed. The foam (Vukoporr A) was made mainly of Al₂O₃. The foam samples were packed in a tubular reactor symmetrically placed in a laboratory furnace. It was assumed that the tested foam should have a surface close to the monolith surface area which was tested in a previous work (Pawlaczyk and Gosiewski, 2015). Pore density of the tested foam was 10 PPI. The tested air mixture contained 0.51–0.76 vol. % of methane. The results show that thermal methane oxidation in foam is possible in the acceptable range of temperatures. The combustion process in foam is characterized by similar ignition temperature to tests carried out in monolith, a more intense course, and better methane conversion at lower temperatures.

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