

EXPERIMENTAL INVESTIGATION OF SELF-IGNITION OF BINARY METHANE MIXTURES WITH C₃–C₅ ALKANE ADDITIVES IN AIR

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Abstract: The effect of C₃–C₅ alkane additives on self-ignition of methane-air mixtures rapidly injected in a reactor is studied under constant volume conditions. Investigations were performed at atmospheric initial pressure and temperature up to 1000 K with stoichiometric and lean mixtures. Experimental results show that small additives of heavier alkanes reduce ignition delays of methane; however, their efficiency decreases as the temperature increases. No negative temperature coefficient of the reaction rate has been observed in the mixtures even with pentane additives.

Keywords: ignition delay; binary mixtures; associated oil gas; methane; propane; butane; pentane; negative temperature coefficient

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