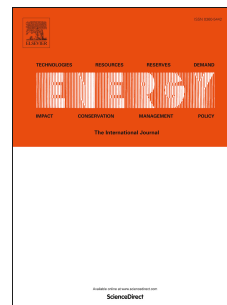


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Experimental study on the effects of mixture flow rate, equivalence ratio, oxygen enhancement, and geometrical parameters on propane-air premixed flame dynamics in non-adiabatic meso-scale reactors

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1 **Experimental Study on the Effects of Mixture Flow Rate, Equivalence**
2 **Ratio, Oxygen Enhancement, and Geometrical Parameters on Propane-**
3 **Air Premixed Flame Dynamics in Non-Adiabatic Meso-scale Reactors**

4
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18
19 **Abstract**

20 In the present study, the effects of reactive mixture flow rate, adding oxygen to propane-air mixture, geometrical
21 parameters, and equivalence ratio on propane-air/oxygen premixed flame dynamics in non-adiabatic meso-scale
22 reactors were experimentally investigated. During the experiments, seven flame regimes of blow-off, blow-out,
23 asymmetric stationary, stationary-repetitive extinction and re-ignition (RERI), forced/self-RERI, RERI-flash-back,
24 and flash-back were observed. The results showed that increasing the reactive mixture flow rate could generally
25 promote variety of the flame regimes and also improve flame stability in the non-adiabatic meso-scale reactors,
26 especially in 40% and 80% oxygen-enhanced cases. Also, the results demonstrated that increasing the reactor inner
27 diameter and equivalence ratio generally extended propane-air- oxygen flame stability and its presence range in the

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