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Experimental investigation of effect of temperature on ignition behaviour of seeded refined kerosene

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The present work carried out is to investigate the ignition behavior of refined kerosene with and without nano additives with the variation of temperature. The base refined kerosene was tested with and without additives of alumina and aluminum nanoparticle for low volume fraction. The refined kerosene nano fluid volume fraction studied were 0.01, 0.05 and 0.1 respectively. Two different experimental methods were used to investigate the ignition behavior of refined kerosene with respect to temperature. The ignition probability was measured experimentally by a hot plate method. The temperature range studied for ignition probability over the flat plate is from 200oC to 480oC. Tests were carried out in shock tube to determine ignition delay of the refined kerosene with and without nano-additives. The study was carried out for a temperature range of 950-1450K in a shock tube reflected mode for and oxygen-rich driven section. The pressure range for the study was limited to 4 to 10 atm. It was observed that with the increase in temperature and volume fraction of nanoparticle irrespective of oxides or metal the ignition probability increased. The ignition delay did not have the significant effect on the low volume fraction of 0.01 and 0.05, but with the increase in volume fraction and an increase in temperature the effect on ignition delay was reported.

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