

Effect of palm-based soap noodles dust concentration on dust explosion severity in a spherical vessel

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ABSTRACT

The dust explosion propagation of palm-based soap noodles was experimentally studied in a 20-L spherical vessel. Understanding the effect of concentration on this metric is a prerequisite to characterizing the severity of the explosion. This study focused on the link between concentration and overpressure (P_{max}), rate of pressure rise (dP/dt), and deflagration index (K_{ST}). The highest P_{max} , dP/dt , and K_{ST} were recorded at 400 g/m^3 , corresponding to a class St-2 dust with a strong explosion. The agglomeration process evidently controlled the mass burning rate, which affected the dust explosion propagation. This data can help design preventive measures related to palm-based soap noodle dust explosions.

KEYWORDS

Agglomeration; Explosion; Deflagration index; Dust; Propagation

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