

Progress of hybrid mixture explosions: from safety characteristics, explosion criteria to explosion regimes

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Explosion of hybrid mixtures is of interest in the fields of industrial safety and a fundamental issue in combustion science and technology. Flammable gases and/or vapours may coexist with combustible dusts to form the hybrid mixtures that could have lower explosion sensitivities and higher explosion severities than the single substances, posing a special hazard to industries and humans. To date, however, there is no test standard available yet to determine the safety characteristics of hybrid mixture explosions, nor the flame propagation and quenching mechanism or theoretical explanation behind these lumped parameters. This talk presents a state-of-the-art overview of the comprehensive understanding of hybrid mixture explosions in experimental study level; thereby, the main limitations and challenges to be faced are explored, with an emphasis on ignition mechanisms, standardised and alternative explosion criteria, and explosion regimes under both atmospheric and non-atmospheric conditions.