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RESEARCH PAPERS

开敞空间蒸气云爆炸压力的实验研究

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摘要 An experimental system was setup to study the pressure field of unconfined vapor cloud explosions.The semi-spherical vapor clouds were formed by slotted 0.02 mm polyethylene film. In the center of the cloudwas an ignition electrode that met ISO6164 "Explosion Protection System" and NFPA68 "Guide for Venting ofDeflagrations". A data-acquisition system, with dynamic responding time less than 0.001 s with 0.5% accuracy,recorded the pressure-time diagram of acetylene-air mixture explosion with stoichiometrical ratio. The initial clouddiameters varied from 60cm to 300cm. Based on the analysis of experimental data, the quantitative relationshipis obtained for the cloud explosion pressure, the cloud radius and the distance from ignition point. Present resultsprovide a useful way to evaluate the building damage caused by unconfined vapor cloud explosions and to determinethe indispensable explosion grade in the application of multi-energy model.

关键词 unconfined vapor cloud explosion safety experiment deflagration

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Experimental Study on Unconfined Vapor Cloud Explosion

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Key words unconfined vapor cloud explosion; safety; experiment; deflagration

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