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Autore	Eckhoff Rolf K
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plants; 2.11 Dust explosion in a silicon powder grinding plant at Bremanger, Norway, in 1972; 2.12 Two devastating aluminum dust explosions; Chapter 3. Generation of Explosible Dust Clouds by Reentrainment and Redispersion of Deposited Dust in Air; 3.1 Background; 3.2 Structure of the problem; 3.3 Attraction forces between particles in powder or dust deposits; 3.4 Relationship between interparticle attraction forces and strength
3.5 Dynamics of particles suspended in a gas3.6 Dislodgement of dust particles from a dust or powder deposit by interaction with an airflow; 3.7 Dispersion of agglomerates of cohesive particles suspended in a gas by flow through a narrow nozzle; 3.8 Diffusion of dust particles in a turbulent gas flow; 3.9 Methods for generating experimental dust clouds for dust explosion research; Chapter 4. Propagation of Flames in Dust Clouds; 4.1 Ignition and combustion of single particles; 4.2 Laminar dust flames; 4.3 Nonlaminar dust flame propagation phenomena in vertical ducts
4.4 Turbulent flame propagation4.5 Detonations in dust clouds in air; Chapter 5. Ignition of Dust Clouds and Dust Deposits: Further Consideration of Some Selected Aspects; 5.1 What is ignition?; 5.2 Self-heating and self-ignition in powder deposits; 5.3 Ignition of dust clouds by electric spark discharges between two metal electrodes; 5.4 Ignition of dust clouds by heat from mechanical rubbing, grinding, or impact between solid bodies; 5.5 Ignition of dust clouds by hot surfaces
Chapter 6. Sizing of Dust Explosion Vents in the Process Industries: Further Consideration of Some Important Aspects

Sommario/riassunto

Unfortunately, dust explosions are common and costly in a wide array of industries such as petrochemical, food, paper and pharmaceutical. It is imperative that practical and theoretical knowledge of the origin, development, prevention and mitigation of dust explosions is imparted to the responsible safety manager. The material in this book offers an up to date evaluation of prevalent activities, testing methods, design measures and safe operating techniques. Also provided is a detailed and comprehensive critique of all the significant phases relating to the hazard and control of a dust explo