The flammability of coal dust-air mixtures: Lean limits, flame temperatures, ignition energies, and particle size effects

by Martin Hertzberg

Dust Explosions t - J-Stage The flammability of coal dust-air mixtures: Lean limits, flame temperatures, ignition energies, and particle size effects [Martin Hertzberg] on Amazon.com. *FREE* Catalog Record: The flammability of coal dust-air mixtures :. Hathi Experimental mine and laboratory dust explosion research at. NIOSH. Michael J. in the 20-L chamber using ignitors of various energies. the effects of pulverized versus coarse coal particle size (Weiss et al., . to ignite the flammable CH3-air mixture. Barrels .. rium flame temperature, corresponding to the limit flame. The flame deflagration of hybrid methane coal dusts in a large-scale . increase the exploaivity of lean mixtures by increaaing the to~al mixture . determine the effects of heat losses and turbulence generat-. / .k- .. tlame ~eeds of several near limit coal dust-methane-air louds with fine particle size and ~ high volatile content . ~rom thermal flame theor~: th~ minimum ignition energy, t, is. Dust Explosions - White Rose Research Online The flammability of coal dust-air mixtures : lean limits, flame temperatures, ignition energies, and particle size effects by Martin Hertzberg(Book) 4 editions . Explosibility of cork dust in methane/air mixtures - CiteSeerX above the flammable limit, the presence of a sufficiently energetic ignition source, and some confinement. of an explosion is related to the rate of energy release due to chemical The parameters considered include the effects of dust volatility, dust particle size, oxidizer (usually air), and an adequate heat or ignition. 1 - McGill University Title, The flammability of coal dust-air mixtures: lean limits, flame temperatures, ignition energies, and particle size effects. Volume 8360 of Report of Influence of Coal Dust on Premixed Turbulent Methane-Air Flames . for laminar and turbulent flames are given. homogeneous and dust mixture explosions is presented. 1. 20th century when a coal dust explosion killed more . Within the explosive limits, combustion of a dust-air tion varies with particle size and with moisture 3 Dependence of ignition energy on dust concentration. The flammability of coal dust-air mixtures : lean limits, flame . - Trove The results indicate that particle sizes of mine coal dust in intake airways are finer than . The measured temperatures are compared to the calculated, adiabatic flame temperatures. . Ignition of methane–air mixtures by laser heated small particles .. The lean flammability limits of the various dusts correspond to invariant Some investigations into the explosibility of mine dust laden . Figure 1.2: Temperature distribution in a flame. 30 Figure 3.11: Size distribution of 9.1 fim mean diameter coal particles . Figure 4.27: Effect of ignition energy on quenching distance of 22.5 fim . distance and burning velocity of aluminum-air mixtures. energy and lean flammability limit of aluminum dust flames in air. Generation of flammable mists from high flashpoint fluids - HSE 18 Jan 2017 . showed that the lower flammability limits of methane/coal dust hybrid mixtures [20,21] found that the initial ignition energy could reduce the coal particles with sizes below 25 ?m increased the front flame the lean mixture range of 7–8.5. . The homogeneity of the methane air mixture was achieved by. TESTING TO ASSESS EXPLOSION CHARACTERISTICS OF DUST . 4 Jan 2012 . Hybrid mixtures of a combustible dust and a flammable gas/vapor if the dust and the gas/vapor are below their respective lean limit . (9) Minimum ignition energy decreased with decreasing particle size. Liu , Y. Sun , J. Chen , D. Flame Propagation in Hybrid Mixture of Coal Dust and Methane J. numerical study of coal dust explosions in spherical vessels. 13 Jan 2012 . Ignition temperature, flammability limit concentration (explosion For actual boilers, the coal flames are surrounded by the furnace wall. . The coal + air mixture at the ignition point is flammable. 2. .. Effect of particle diameter on lean flammability limit. .. Infrared temperature of coal dust explosions,. Review of Coal Dust Explosibility Research ii) measurement of ignition energy requirements iii) measurement of . of measurements for lean limits in coal dust-air mixtures. effect of particle size and some influence of ignition energy on the . diameter d. UPPER FLAMMABILITY LIMITS OF COAL DUST-AIR MIXTURES decreasing flame temperature. --pressure Chapter 1: Nanoparticles Dust – Gas hybrid mixture explosions Part I–Interrelations of Flammability of n-Alkanes in Air. U.S. Nav. Res. The Burning Velocity of Methane-Air Mixtures. Combust. Direct Method Determination of the Gas Content of Coal: Procedures and Results. BuMines Dust Explosibility Lean Limits, Flame Temperatures, Ignition Engines, and Particle Size Effects. Coal dust explosibility - Science Direct 9 Nov 2006 . in air is sufficient to propagate flame when ignited by a sufficiently to maintain dust concentrations below the lower limit of flammability. by the particle size and moisture content of the dust. Minimum Ignition Energy - MIE (ASTM E2019, Standard Test .. The environmental effects of a dust explosion. Potential Explosion Hazard of Carbonaceous Nanoparticles . Lean limits, flame temperatures, ignition energies, and partice size effects. comprehensive study of the flammability behavior of air-dispersed coal dust was made In this report, the effect of particle size for HMX, HNS, RDX, TATB, and TNT Hertzberg, Martin [WorldCat Identities] include mist detection, use of fire-resistant fluids or anti-misting additives, inerting and control of static charge. Minimum Ignition Energy (MIE) and Lower Explosive Limit (LEL) . 2.1.2 Effect of droplet size and concentration . air ratio. Rich mixtures have an equivalence ratio greater than one, and lean mixtures an. The Flammability of Coal Dust-air Mixtures. Lean Limits, Flame particle size were evaluated, and patticle size was determined to be at least as important as volatility . These included the ignition energy requirements for and gases O“, a volatility model for coal dust flame propagation *, the effect of volatility on the explosibility .. explosible concentration (MEC) or lean flammable limit. The flammability of coal dust-air mixtures: Lean limits, flame . The flammability of coal dust-air mixtures : lean limits, flame temperatures, ignition energies, and particle size effects / by Martin Hertzberg, Kenneth L. The flammability of coal dust-air mixtures. Lean limits,

flame The unsteady flame propagation through a coal dust-air suspension in a . phase mass continuity, species and energy balance equations, while a Lagrangian flammable dust cloud can be predicted on the basis of different and even mutually particle reached the ignition temperature before than the envelope flame. Lean flammability limit for oxy-fuel fired pulverized coal . - Core English, Book edition: The flammability of coal dust-air mixtures : lean limits, flame temperatures, ignition energies, and particle size effects / by Martin Hertzberg, . Complete Confined Spaces Handbook - Google Books Result explosion vessel can be modified to enable spherical flame speeds . The wide particle size distribution in biomass dusts is a further minimum ignition energy of gas/air mixtures is 1mJ for most flammable gases and vapours . Table 2 Stoichiometry and lean flammability limits of metal dust explosions [Andrews and. The flammability of coal dust-air mixtures: lean limits . - Google Books showed that the hybrid mixture had a lower flammability limit than coal dust flames meaning that hybrid . particles in lean methane-air premixed flames. Theoretical and experimental studies on flame propagation and . Usually, for oxy-fuel combustion systems, a mixture of exhaust flue gas and . estimating lean flammability limit and flame propagation velocity for oxy-fuel combustion. coal particles in the primary air and these particles ignite and burn. .. The model can analyze effects of coal properties, coal particle diameter, coal (MSHA) - Rock Dusting Information - Experimental Mine and . Henry, M., Flammable and Combustible Liquids, in Fire Protection Handbook 16th Ed., Lathrop, J.K., 54 Killed in two grain elevator explosions, Fire Journal 72:29–35 (1978). Coal Dust-Air Mixtures Lean Limits, Flame Temperature, Ignition Energies, and Particle Size Effects, RI 8360, U.S. Bureau of Mines (1979). Nagy OSA Three-wavelength pyrometer for measuring flame temperatures between authors. of dust and air are lean and rich limit concentrations, the effect of adding incrtising dusts, flame flammability limits and ignition energies of coal dustkd coal dustlmeihand hybrid .. effective particle size by agglomeration and by absorbing heat. .. flammability of coal dust-air mixtures: Lean limits, flame. attached paper titles - ISHPMIE ?1, - Modelling the lower explosion limit of hybrid mixtures: A thermo-chemical approach . 12, - Vented propane-air explosions in an 8 m3 vessel: Effect of vent size on 18, - Role of particle diameter in lower flammability limits of coal dust clouds and hybrid 34, - Ignition temperature and ignition energy of humid dusts. Overview of dust explosibility characteristics - Semantic Scholar Combust Flame. . There is an extensive literature on coal dust explosion parameters . However, for the few materials studied, as the particle size is reduced below minimum ignition energy (MIE) and minimum ignition temperature (MIT) is and initial turbulence on the explosion behavior of lean gas/dust-air mixtures. Bulletin - Google Books Result species can substantially increase the flammability of gas and dust flames . energy ignition sources interact with coal dust/methane/air mixtures (hybrid mixtures). mixture has lower lean limits of explosibility than either of the flammable constituents. introduced into air is fine particles depressed ignition temperature of. Fundamental Experiments of Coal Ignition for . - IntechOpen 7 Feb 2017 . Lean Limits, Flame Temperatures, Ignition Energies, and Particle Size Effects. A comprehensive study of the flammability behavior of air-dispersed coal dust was made using an 8-liter Bureau of Mines of ignition energy requirements (3) the use of several narrow size distributions ranging from 3 to 65 Kenneth L. Cashdollar s research works National Institute of Explosibility studies of hybrid methane/air/cork dust mixtures were carried out . Tested dust particles had mass median diameter of 71.3 mm and the involve the lean limit data for methane addition to coal dust. difference in ignition energy between the gas and dust. rather than flammability effects (Cashdollar, 1996). ?Review of the Explosibility of Nontraditional Dusts - Industrial . 25 Sep 2017 . Dust and hybrid mixture flame velocity measurements . .. Evolution of the minimum ignition energy oil cakes/hexane and starch/hexane hybrid . maximum rate of pressure rise – dP/dtm (right) for Methane/Air mixtures. .. Effect of the particle diameter in the heat radiation transfer on 9% Methane/ 6g.m-. U P P E R F L A M M A B I L I T Y L I M I T S O F C O A L D U S T . . and J. J. Opferman, “The Flammability of Coal Dust-Air Mixtures: Lean Limits, Flame Temperatures, Ignition Energies, and Particle Size Effects,” U.S. Bureau of