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煤粉末的爆炸机理

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Explosion mechanism of carbon powder

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摘要 针对流态化炭催化CH4/CO2重整制合成气中可能存在的爆炸问题,对煤粉末爆炸特性进行了研究,研究表明煤粉末的挥发分含量越高,爆炸强度越大。对煤粉末试样及爆炸产物进行的工业分析和SEM分析显示,爆炸后煤粉末的挥发分降低了5%～10%,灰分有所增加,而水分变化不大;爆炸前煤粉末试样的外表形状棱角分明,而爆炸后残余物的外表形状比较光滑,近似球形,且燃烧不充分。研究认为,煤粉末爆炸的机理是煤粉末受热后,挥发分首先被释放,参与反应,从而引发爆炸,煤粉末爆炸实质上是气体爆炸。 更多还原

关键词： 爆炸力学 爆炸机理 SEM分析 煤粉末 挥发分

Abstract： Aimed at the explosion of the CH4/CO2 reforming reaction,a series of investigations were carried out to explore the explosion characteristics of the carbon powder. It is indicated that the higher the volatile content in the carbon powder,the greater the explosion intensity. The coal powder samples and the explosion products were analyzed by the industry and SEM. The industry analysis shows that after explosion the volatile content in the coal powder decrease 5%10%,the ash content increases slightly and the moisture content changes weakly. The SEM analysis reveals that the explosion products appear similar to spheres and smoother than the original samples,and that the coal powder cannot combust sufficiently. Investigated results display the explosion mechanism that the volatile matter is firstly released from the heated coal powder samples and joins in reaction,consequently causes explosion. In essence,the carbon powder explosion is a gas explosion.

Keywords： mechanics of explosion explosion mechanism SEM analysis carbon powder volatile matter

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