

33-38 Burning characteristics of emulsion explosive confined in steel pipe

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Emulsion explosive is usually processed at high temperature in manufacturing. Deflagration to detonation transition (DDT) tests of the emulsion explosives were carried out with small size equipment that has been arranged from the French method. All the tests were performed at the elevated temperature of around 100°C to evaluate the safety in the manufacturing process of the emulsion explosives. The emulsion explosives that contain plastic microballoons (PMB) as the density control material showed no steady reaction. The emulsion explosives sensitized with glass microballoons (GMB) caused partial reaction that lead to the rupture of steel pipe close to screw cap, followed by the reaction interruption without significant damage to the major part of pipe. Pressure vessel tests were carried out to verify the above result. A GMB-sensitized emulsion explosive containing aluminum powder of 33 μ m in diameter showed steady burning or deflagration just like the case of black powder. Installing a rupture disc to pipe as safety device is effective to release the pressure induced by the partial reaction and to prevent the violent reaction which leads to DDT.

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