

Abstract Submitted
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Detonation behavior of emulsion explosives sensitized with polymeric microballoons RICARDO MENDES, JOSÉ RIBEIRO, ADAI - Assoc. Devel. Aerodynamics Industrial; LEDAP- Lab. Energetics Detonics; Depart. of Mechanical Engineering; University of Coimbra, IGOR PLAKSIN, ADAI - Assoc. Devel. Aerodynamics Industrial; Depart. of Mechanical Engineering; University of Coimbra, JOSÉ CAMPOS, ADAI - Assoc. Devel. Aerodynamics Industrial; LEDAP- Lab. Energetics Detonics; Depart. of Mechanical Engineering; University of Coimbra — The differences between the detonation behavior of ammonium nitrate based emulsion explosive sensitized with polymeric or with glass microballoons is presented and discussed. Expancel[®] are hollow polymeric microballoons that contain a hydrocarbon gas. The mean particle size of those particles is 30 μm and their wall thickness is about 0.1 μm . The detonation velocity and the failure diameter of the emulsion explosive sensitized with different amounts of these particles were measured, in cylindrical charges, by ionization pins and optical fibers. The detonation velocity of emulsion explosives shows a non-monotonic evolution with the density with the maximum being reached far below the maximum density. The detonation fails when the density approaches the one of the matrix. The failure diameter increases with increasing density. For low densities the detonation velocity is almost independent of the charge diameter and it is close to the values predict by BKW EoS. The effect of the nature and size of the microballoons on the detonation front curvature and failure diameter was also determined.

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