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复合敏化乳化炸药的压力减敏

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Pressure desensitization of emulsion explosives sensitized by compound sensitizers

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摘要 为了解敏化剂对乳化炸药压力减敏的影响,研究了"化学发泡+空心玻璃微球"和"空心玻璃微球+膨胀珍珠岩"2种复合方式分别敏化的乳化炸药压力减敏。依据乳化炸药爆炸冲击波的波峰值,计算了它在水下受到冲击波作用之后的压力减敏度,将复合敏化的乳化炸药与分别用单一敏化剂的乳化炸药压力减敏度作了比较和分析。结果表明,第1种复合方式敏化的乳化炸药压力减敏度介于单一敏化的乳化炸药之间,以10cm受压距离为例,压力减敏度分别为1.000、0.983、0.210;第2种复合敏化的乳化炸药压力减敏度小于单一敏化的乳化炸药,10cm受压距离的压力减敏度分别为0、0.274、0.618。分析认为,敏化剂颗粒或气泡的破损与其微界面周围局部破乳的综合作用是造成乳化炸药压力减敏的主要原因。

关键词： 爆炸力学 压力减敏 冲击波 乳化炸药 复合敏化

Abstract： To find out the relationship between the sensitizer and the emulsion explosive pressure desensitization,the pressure desensitization of the emulsion explosives was studied which were sensitized respectively with two types of compound sensitizers of "chemical foaming agent + hollow glass microballoon particles" and "hollow glass microballoon particles + expanded perlite". The pressure desensitization degrees were calculated with the explosion wave crest value of the emulsion explosive which was tested under water after it was pressed by the host charge' explosion wave,and the pressure desensitization degrees of the emulsion explosives with the compound sensitizers were compared with that of the emulsion explosives with a single sensitizer. The results indicates that the pressure desensitization degrees of the emulsion explosives sensitized with the first compound method are between that of the emulsion explosives sensitized by single chemical foaming agent and that of the emulsion explosives sensitized with single hollow glass microgalloon,for example,the desensitization degrees at the 10 cm pressed spacing are 1.000,0.983,0.210 respectively,and that the pressure desensitization degrees of the emulsion explosives sensitized with the second compound method are less than that of the emulsion explosive sensitized respectively by the single sensitizer of hollow glass microgalloon and expanded perlite,their desensitization degrees at the 10 cm pressed spacing are 0,0.274,0.618 respectively. Results show that the pressure desensitization of the emulsion explosives was caused mainly by the combining effect of the anti-pressure performance of the sensitizer particles or bubbles and the partial emulsion breakage around the micro-interfaces between the particles and emulsion matrix.

Keywords： mechanics of explosion pressure desensitization shock wave emulsion explosives compound sensitizing

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