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Effects of Ratios of Aluminum to Oxygen on Shock Wave of Cylindrical Charge at Underwater Explosive Close-field

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Abstract: Three kinds of cylindrical charges based on RDX with different ratios of aluminum to oxygen were tested through underwater explosion. Attenuation law of shock wave peak pressure versus transmission distance at close-field underwater explosion was resolved by high-speed scanning. The effects of Al/O ratios on initial shock wave peak pressure and attenuation were analyzed. Results show that the initial shock wave peak pressure achieves 18.95 GPa, 13.66 GPa and 8.35 GPa respectively when the Al/O ratios are 0, 0.4 and 0.7. The speed of peak pressure attenuation decreases with the increasing of aluminum content. The factors, such as the time of aluminum beginning to react and the degree of reaction, have remarkable effects on shock wave peak pressure at close-filed and attenuation of peak pressure.

Key words: explosion mechanics; aluminiferous explosive; underwater explosion; ratio of aluminium to oxygen; shock wave at close-field

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time	presentation	presenter
9 月 7 日	Detonation Phenomena	Manfred Held
	Raw Materials for High Explosives (RDX, HMX, PETN, CL20, NTO, NQ, HNS, TATB)	Paul Wanninger
	Desired High Explosive Performances	Manfred Held
	High Explosive Components (Plastizisers, Binders, Curry Agents, Bonding Agents, Burning Modifier, Flame Depression Agents, Metal Powders)	Paul Wanninger
9 月 8 日	Introduction in Production of High Explosives (Melt Cast, Cure Cast, Pressed)	Manfred Held
	More Details to the High Explosive Production Requirements	Paul Wanninger
	Sensitivity, Survivability, Initiability Tests	Manfred Held
	Test Results with PBX Charges and Warheads	Paul Wanninger
9 月 9 日	Propellants (NG, NC, AND, Degon, AP, AN, GAP, Nitramins)	Paul Wanninger
	High Explosives Used as Ejection Charges	Manfred Held
	MIL STD1205 (Fast Cookoff, Slow Cookoff, Bullet Impact, Projectile Impact, Shaped Charge Jet Impact, SC Secondary Fragments)	Manfred Held
	Detmatimbehaviour (Detonation Velocities, Guerney Velocities, Critical Diameter, GAP Tests)	Paul Wanninger
9 月 10 日	High Explosive Charges for Shaped Charges	Manfred Held
	Initiation Threshold by Fragments	Manfred Held
	Initiation Thresholds by Shaped Charge Jets	Manfred Held
	Dual Composition Explosives	Manfred Held
9 月 11 日	Introduction into Corner Turning Distance	Manfred Held
	Corner Turning Distance Test Methods	Manfred Held
	Diagnostic with FXR of Detonation Events	Manfred Held
	Demilitarisation High Explosives and Propellants	Paul Wanninger