

Precipitation of high energetic material by rapid expansion of supercritical solvent

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Research Department eXplosive(RDX) is high energetic material which is more powerful than TNT, most general explosive. But RDX has high sensitivity than TNT which can lead to unintentional explosion. So decreasing sensitivity of RDX is highly necessary when using RDX. To decrease sensitivity of RDX, we micronized the RDX particle by a precipitation process. When RDX particle gets smaller, sensitivity also gets lower, because small particle can decrease the size of hotspots. There are lots of processes to precipitate the target materials. We used Rapid Expansion of Supercritical Solvent process called RESS. RDX is soluble in high pressure, slightly high temperature carbon dioxide. First, supercritical carbon dioxide was saturated by RDX in extraction unit. Then, supercritical carbon dioxide solution was depressurized to atmospheric pressure through 100 μ m plate orifice. Depressurized carbon dioxide lost its solvent power and RDX particle was precipitated. Carbon dioxide went to gas phase and was separated from RDX particle. Finally, RDX particle was collected in expansion vessel. RDX sample was analyzed by FE-SEM. Particle size distribution was calculated by image analysis.