

Formation of Submicron-sized RDX Particles by Drowning-out

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It has been known that micronization of explosives enables improvement of performance and reduction of sensitivity of explosives because of broad specific surface area and small amount of internal defect. For this reason, several techniques such as rapid expansion of supercritical solution (RESS), RESS into an aqueous solution (RESS-AS), and drowning-out with ultrasonic irradiation have been reported. In this work, a drowning-out method combined with spraying through the nozzle without supercritical solution and ultrasound irradiation was conducted for the micronization of 1,3,5-Trinitro-1,3,5-triazinane (RDX). Temperature of solution and antisolvent, distance between the nozzle and surface of the antisolvent, and antisolvent composition were controlled to micronize the RDX. The controlled temperature and distance ranges are 0 to 40 °C and 2.5 to 4.9 cm, respectively, and the antisolvents used are water, isopropanol, and hexane.