

Morphology change of HMX crystals by co-precipitation with PVA during SAS process

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Recrystallization of explosives using SAS process has advantages in that the process conditions are milder than the conventional recrystallization techniques and the particle size, size distribution and morphology can be controlled by simply changing the process parameters. HMX(Cyclotetramethylenetetranitramine) was precipitated using SAS process. Morphology control was attempted by co-precipitation of HMX with PVA (Polyvinyl alcohol). Dimethyl sulfoxide was chosen as the solvent considering the modest solubilities of both HMX and PVA in it. When precipitated with PVA, dissolved in the initial solution, the obtained HMX crystal morphology changed from needle-like shape(α -HMX) to plate-like shape(γ -HMX). The change of morphology can be seen from the SEM image of the particles and can be confirmed from the change in XRD patterns.