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Manganese oxalate nanorods as ballistic modifier for composite solid propellants

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Graphical abstract

Highlights

- Manganese oxalate nanorods were prepared using mild thermal precipitation and aging
- The nanorods were found to be efficient ballistic modifier for solid propellants
- The nanorods sensitized the thermolysis of ammonium perchlorate
- Controlled thermal decomposition of nanorods yielded manganese oxide nanoparticles
- MnO nanoparticles formed insitu in the condensed phase enhance the burning rates

Abstract

Rod-shaped nanostructures of manganese oxalate (MnC_2O_4) were synthesized via mild thermal precipitation and aging process. Chemical composition of the MnC_2O_4 nanorods were confirmed using Fourier transform infra-red (FTIR) spectroscopy and energy dispersive X-ray spectroscopy (EDS). X-ray diffraction (XRD) and selected area electron diffraction (SAED) studies revealed the crystal structure. Field emission scanning electron microscopy (FE-SEM) imaging and high

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