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Review on Methods of Preparing Nanocomposites Energetic Materials in Liquid Phase

ZHANG Guang-quan, LI Jin-shan

(Institute of Chemical Materials, CAEP, Mianyang 621900, China)

Abstract: Several methods of preparing nanocomposites energetic materials in liquid phase by using sol-gel chemistry, spray route, precipitation and freeze-drying are reviewed. Metal-oxide-based nanocomposites energetic materials are prepared mainly by sol-gel, and the preparation of $\text{Fe}_2\text{O}_3/\text{Al}$ nanocomposites is illustrated. Spray route including spray drying and Rapid Expansion of Supercritical Solution (RESS) instead of solvent with CO_2 supercritical fluids are introduced, mainly by which nanocomposites with energetic materials and nanostructured metal particles are prepared. Precipitation and Compressed Fluid Antisolvent (PCA) instead of precipitation reagent with CO_2 supercritical fluids are also given. Composites with inorganic oxidizer and nanostructured metal particles are prepared by freeze-drying, and $\text{NH}_4\text{ClO}_4/\text{Al}$ nanocomposites is illustrated.

Key words: materials science; energetic material; sol-gel; spray; precipitation; freeze-drying; supercritical fluid



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