Ionic liquid supported synthesis of nano-sized rare earth doped phosphates.

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Streszczenie

The studies presented in this paper are devoted to nanoscale lanthanide orthophosphates, $LnPO_4$ (Ln=Y, La, Gd, doped with Eu^{3+} and Ln=Pr^{3+}, Nd^{3+}, Sm^{3+}, Eu^{3+}, Tb^{3+}, and Dy^{3+}). All materials were synthesized in phosphate ionic liquids with the ionic liquid acting not only as reaction medium and morphology controlling agent but also as the reaction partner (phosphate source). We investigated the influence of the ionic liquid as well as post-fabrication heat-treatment on the phosphors' optical properties and particles morphology. A significant role of the ionic liquid in the synthesis procedure was found, and optimization of the synthesis conditions led to pure luminescent materials with very good optical properties such as long decay time and high quantum efficiency.

Słowa kluczowe

ionic liquids, nanoparticles, Lanthanum orthophosphates, Rare earth ions, Luminophores

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