

## **Polymeric Citrate Precursor Method in Preparation of Gadolinium Zirconate Powders**

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Gd<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> pyrochlore is a potential material for use as a matrix for the immobilization of actinides from spent nuclear fuel. It was examined that under the influence of high-energy particles coming from radioactive decays gadolinium zirconate pyrochlore is not amorphized but undergoes an order–disorder structure transformation, which leads to the formation of a defect fluorite structure. However, preparation Gd<sub>2</sub>Zr<sub>2</sub>O<sub>7</sub> material with pyrochlore structure cause many difficulties, because of its narrow range of stability and low tolerance to no stoichiometry. It appears that one of the method for synthesizing this product, which can provide a suitable composition to obtain the desired pyrochlore structure is a polymeric citrate precursor method.

The aim of the presented work was to examine the influence of citric acid and ethylene glycol content on the properties of received gadolinium zirconate powders prepared by polymeric citrate precursor method. Gadolinium zirconate precursors produced with the use of different concentrations of citric acid and ethylene glycol were subjected to heat treatment in order to obtain single phase material with the pyrochlore structure. The microstructural observations (SEM) and phase composition analysis (XRD) for obtained powders were carried out.

Key words: gadolinium zirconate, polymeric citrate precursor method, pyrochlores, fluorite, ceramic powders

The work was supported by the National Science Centre (NCN, Poland), decision no. DEC-2013/11/N/ST8/01543

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