Phase formation path of $ZnWO_4$ synthetized by the polymerizable complex method: study by X-Ray Diffraction (XRD) and Scanning Electron Microscopy

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In this research, we report on a new path of $ZnWO_4$phase formation, synthesized by the polymerizable complex (PC) method using X-Ray Diffraction (XRD) and Field Emission Scanning Electron Microscopy (FE-SEM) coupled with an Energy Dispersive X-Ray Spectroscopy (EDS). The FE-SEM analysis was performed at low (3 kV) and high (15 kV) voltages using a high-sensitive solid-state backscattered detector (vCD FEI detector), as well as an in-lens detector for secondary electron image analysis. At 550 °C, we obtained a single phase of the $ZnWO^4$complex oxide. To explain the phase transformation processes, we propose a mechanism based on the coexistence of more than one amorphous phase after the pre-pyrolysis process. These amorphous metastable phases indicate a different phase formation path, which has not yet been described in the literature for multi-component oxides processed by the PC method. The formation path proposed here shows the relevance of the metastable phases in the reaction processes of complex oxides.

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