CERIUM FLUORIDES: INFLUENCE ON BORON OXIDATION
AND NEW METHOD OF SYNTHESIS

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Abstract: The aim of this work is increasing the efficiency of oxidation of amorphous boron in air. The influence of cerium fluorides on suppression of the reduction reaction of boron has been studied. Thermodynamic analysis and experimental investigations (differential scanning calorimetry, thermogravimetric analysis, and thermometry by microthermocouples) of interaction between the cerium fluoride mixtures with boron and boron oxide have been carried out. The results of the research prove the possibility of decreasing the temperature of boron active oxidation in the presence of CeF₃ or CeF₄, which is more preferable. The lower thermal stability of CeF₃ compared to CeF₄ has been found. An original method of synthesis of CeF₃ using XeF₄ fluorination has been proposed.

Keywords: cerium fluorides CeF₃; cerium trifluoride CeF₃; cerium tetrafluoride CeF₄; amorphous boron; boron oxide B₂O₃; xenon difluoride XeF₂; boron oxidation; thermal stability of cerium fluorides; thermodynamic (TD) calculations; differential scanning calorimetry (DSC); thermogravimetric analysis (TGA); exothermic effect; CeF₃ synthesis; XRD analysis; analysis of experimental results

References

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