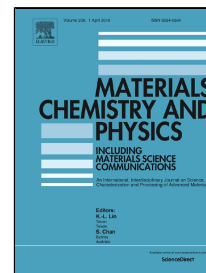


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## Rapid microwave-assisted synthesis of zirconium aluminide

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**ABSTRACT**

Here we show a fast and direct zirconium aluminide alloys manufacturing process using the microwave-assisted technique. The rapid microwave-assisted synthesis was performed using two different starting precursors (Zr and ZrH<sub>2</sub>) revealing the ZrAl<sub>3</sub> phase as the main phase formation, with a small percentage of ZrAl<sub>2</sub>. The phase formation and its percentages were evaluated and confirmed by combining X-ray diffraction and chemical analysis data. In addition, the scanning electron microscopy revealed that the samples bodies based on ZrH<sub>2</sub> samples showed smaller particle size compared with the Zr ones. This was attributed to the microwave radiation concentration that might lead several dehydrogenation sites to generate a non-homogeneity reducing the particle. These findings provide a novel, rapid and versatile method to design zirconium aluminide alloys according to the desired application by controlling the starting precursors (Zr or ZrH<sub>2</sub>) and microwave exposure time.

Keywords: Microwave synthesis, zirconium aluminide, intermetallic compound, microstructures.

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