

## **Static X-ray scans on the titanium hydride (TiH<sub>2</sub>) powder during dehydrogenation**

### **Abstract**

This work investigates the dehydrogenation of TiH<sub>2</sub> powder during isothermal heating at 600°C using the static x-ray scans of high temperature x-ray diffraction (XRD). As-received TiH<sub>2</sub> powder with a particle size of 5 μm and purity of 99.1% was used for this measurement. With increasing temperature, phase transformations occurred because of dehydrogenation and it happened very fast. It was found that during the phase transformation of TiH<sub>2</sub> to titanium, some transitional phases observed and occurred. This finding confirmed the in-situ determination of TiH<sub>2</sub> powder dehydrogenation by using Rietveld Refinement Method from our previous research. This study is useful for the fabrication of titanium-based composites and titanium alloys from TiH<sub>2</sub> powder because the different phases in TiH<sub>2</sub> will affect the final mechanical properties in titanium.

### **Keywords**

Dehydrogenation; High temperature XRD; Phase transformation; Titanium hydride