

Neutron Diffraction Study (Mo, W)Si₂ Prepared by Self-Propagating High-Temperature Synthesis

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Abstract

Neutron diffraction study of (Mo,W)SiO₂ powders was carried out to study the formation mechanism of the silicides. The powders were prepared by self-propagating high temperature synthesis with element powders such as molybdenum, tungsten and silicon in inert argon atmosphere. The combustion behaviors were retarded by adding tungsten. Rietveld refinements of each patterns converged to good agreement($\chi^2=1.88 \sim 2.24$). As the tungsten content increases, the lattice parameters of the moly disilicide were changes from $a=0.3204$ nm, $c=0.7844$ nm, $a=0.3206$ nm, $c=0.7841$ nm and $a=0.3207$ nm, $c=0.7839$ nm. The microstructural analysis by scanning electron microscopy and the chemical analysis of the final products by neutron diffractometry indicated that the formation of (Mo, W)Si₂ occurs via dissolution of Mo and W into Si melt followed by silicide precipitation.

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감마선에 의한 PCE 분해에서갯벌의 촉매작용 Catalytic Activity of Clay from Tidal Flat Sediments in the Decomposition of PCE by Gamma-rays

정홍호, 정진호, 윤정효, 유대현, 이면주
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요 약

감마선에 의한 PCE 분해에 갯벌을 촉매로서 이용하여 우수한 촉매작용을 확인하였다. 촉매로 이용한 갯벌을 공기분위기에서 500 °C 이상 열처리할 경우 TiO₂ 보다 우수한 PCE 분해활성을 나타냄을 알 수 있었다. 갯벌의 열처리에 의한 특성변화를 XRD 와 EPR 로 평가하였으며, 이로부터 갯벌의 촉매 작용은 자연방사에 의해 형성되는 결합점 강도가 감소할수록 PCE 분해활성이 증가함을 알 수 있었다.