

## Coarsening of Cubic TiC Grains with Round Edges in Liquid Ni-rich Matrix

Seung Min Kim, Ji Yeon Ko, and Duk Yong Yoon

Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology

When TiC with 2, 5, 10, 20, 30, and 40 wt% Ni powder compacts are sintered at 1400°C after packing in carbon powder in a graphite crucible, the grains have {100} faces and rounded edges. The equilibrium shape must thus be a cube with {100} faces and round edges. Such a grain shape indicates partial roughening of the singular {100} surfaces. In TiC-20 wt%Ni specimen with relatively high liquid volume fraction, the normalized grain size distributions are relatively narrow and time-invariant. The grain growth follows a cubic rate law and the rate increases with decreasing Ni content from 40 wt% to 10 wt%. These results indicate diffusion controlled normal grain growth. In TiC-2 wt%Ni specimen with relatively low liquid volume fraction, however, the evolution of microstructures with increasing sintering time shows typical Abnormal Grain Growth (AGG). The growth mechanism of TiC grains with liquid Ni matrix is expected to be controlled by both diffusion and step nucleation rate. Because in specimens with high liquid volume fraction such as TiC-20, 30, 40 wt%Ni, diffusion rate might be low compared to step nucleation rate, the grain growth will be mainly limited by diffusion rate. In specimens with low liquid volume fraction such as TiC-2, 5 wt%Ni, however, the grain growth will be limited by step nucleation rate due to high diffusion rate.

## 열 필라멘트법에 의한 다결정 실리콘 박막의 화학 기상 증착

### Chemical Vapor Deposition of Poly-Si Thin Films by Hot Filament CVD

신승도, 황농문, 김도연  
서울대학교 재료공학부

최근 액정 표시 장치의 박막 트랜지스터와 태양전지에 널리 사용되고 있는 비정질 실리콘을 응답 속도와 에너지 변환 효율이 우수한 다결정 실리콘으로 대체하기 위하여 많은 연구가 행해지고 있다. 본 연구에서는 multi-HWCVD를 이용하여 유리 기판에 다결정 실리콘의 저온 증착을 행하였다. 증착된 박막은 기존에 보고된 다결정 실리콘 박막과 달리 비정질을 거의 함유하지 않았으며 결정 입자들이 매끈한 표면을 가진 마름모꼴 피라미드 형태를 나타내었다. 이와 같은 결정 외형은 입방정 결정 구조에서 발달하기 어려운 형상인데 이는 쌍정에 의해 결정된 형상임을 알 수 있었다.