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Hexamethyldisilane(HMDS)을 이용한 3C-SiC의 증착 및 특성평가 The deposition and characterization of 3C-SiC using Hexamethyldisilane(HMDS) by LPCVD

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Silicon carbide(SiC)는 넓은 에너지간격과 고온에서의 우수한 전기특성, 높은 전자 이동도, 높은 포화 전자 이동도 와 열 안정성 등의 특성으로 인하여 고온, 고주파, 고출력영역에서 사용할수 있는 반도체물질로도 주목받고 있다, 이에 본 연구는 단일 선구체인 HMDS를 이용하여 p-type Si(111) 기판위에 SiC를 화학기상증착방법(CVD)으로 증착 하였으며, 박막성장시 선구체의 유량, 반응온도, 반응 압력, 가스공급방법 등 다양한 성장변수에 따른 박막의 결정성변화를 연구하였다, 증착된 박막의 물리적 특성은 X-선 회절(XRD), 적외선 분광(FTIR), 주사전자 현미경(SEM), Hall measurement, 그리고, current-voltage(I-V)특성 등을 조사하였다

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Modification of infiltration method for B₄C/Al composite

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The wetting of B₄C-Al composites occurs at above 1000°C that is higher than the melting temperature of Aluminum, and at which the driving force of chemical reactions becomes high. This phenomenon can be a serious problem when the initial amount of B₄C and Al should be maintained

In this study, fast infiltration and lowering of infiltration temperature were occurred when titanium metal is added Titanium reacts with B₄C at low temperature and the reaction is strongly exothermic reaction If titanium reacts with B₄C and TiB₂ is formed, the heat makes aluminum flexible and formed TiB₂ enhances wettability

In addition, pre-heat treatment of B₄C preform quite contributed to enhance wettability. After heat treatment of comparably low temperature of 1300°C, the infiltration temperature was lowered and the time for infiltration was decreased