T-01

RF 마그네트론 스퍼터링에 의한 bismuth telluride 열전박막의 제조

김동호, 이건환, 조성래*

한국기계연구원 재료기술연구소 표면기술연구센터, *울산대학교 물리학과

Recently interest in thermoelectricity has resurged in applications for thermal management of VLSI microelectronics and optoelectronics. However, the wide application of thermoelectric module including power generation, is limited by its' efficiency. The excellent crystalline quality could be obtained with sophisticated deposition techniques such as molecular beam epitaxy. However, for the practical usage, film preparation with more conventional deposition technique is required.

In this study, thermoelectric bismuth telluride thin films were prepared on SiO_2/Si substrates with RF magnetron sputtering. Co-sputtering of constituent elements were performed to control the stoichiometry of film. Effects of the deposition temperature on the characteristics of films' structure and their thermoelectrical transport properties were investigated. Surface morphology, composition, and crystalline quality were characterized with FE-SEM, EDX and XRD. Electrical transport properties were evaluated with Hall effect measurements. Thermopower(or, Seebeck coefficient) of bismuth telluride films were measured with a temperature gradient method.