

PREPARATION OF BaSnO₃ TARGET MATERIAL FOR PULSED LASER DEPOSITION

Akram Abdalla, Sergei Bereznev, Olga Volobujeva and Valdek Mikli

Department of Materials and Environmental Technology, Tallinn University of Technology, Ehitajate tee 5, 19086 Tallinn, Estonia

e-mail: akram.ibrahim@ttu.ee

Complex oxide thin film and nanostructures are the building block for new “oxide electronic” applications such as TCO, ultraviolet light emitting diodes, buffer layers, chemical sensors, etc. Wide band gap BaSnO₃ with high room temperature electrical conductivity is a significant prospective material as transparent conductive oxide [1]. Pulsed-laser deposition (PLD) is one of the most promising techniques for the deposition of complex-oxide heterostructures, superlattices, and well-controlled interfaces [2].

In this study we report the formation of barium stannate peroxy precursor BaSnO₂(O₂) at low temperature via precipitation method from alkaline media. Then as a result of heat treatment at 800 °C for 4 h microporous BaSnO₃ has been formed successfully. HR-SEM micrograph (Fig 1) illustrate homogenous microporous structure of BaSnO₃, with average grain size diameter around ~ 0.4µm. In addition, EDX analysis of calcinated powder showed the atomic ratios of all constituent elements near to stoichiometry of BaSnO₃. Therefore, the obtained BaSnO₃ powder can be applied for target preparation by sintering or hot-pressing technology for the following thin film deposition by PLD.

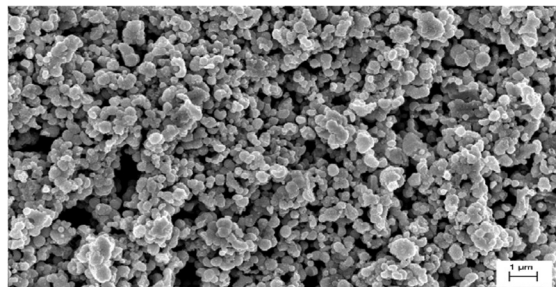


Fig 1: HR-SEM micrograph of BaSnO₃ powder

References

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2. Lee H N, Christen H M, Chisholm M F, Rouleau C M and Lowndes D H. Nature, **433**, 395 (2005)