

Abstract Submitted
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Cold plasma cleaning of SmCo₅ nano-flakes prepared by surfactant-assisted Ball-milling GUANGBING HAN, Department of Physics, University of Texas at Arlington, Arlington, TX 76019, USA; College of Physics, Shandong University, Jinan, 250100, China, KE WANG, KEVIN E. ELKINS, ZHAOGUO QIU, Department of Physics, University of Texas at Arlington, Arlington, TX 76019, USA, RICHARD B. TIMMONS, CHARLES R. SAVAGE, Department of Chemistry and Biochemistry, University of Texas at Arlington, Arlington, TX 76019, USA, J. PING LIU, Department of Physics, University of Texas at Arlington, Arlington, TX 76019, USA — Surfactant assisted high energy ball milling has recently been successfully utilized in producing nanostructured hard magnetic powders. However, it is challenging to remove the surfactant on the surface which deteriorates magnet's properties during heat treatments. Cold plasma is suitable for removing organic surfactant on surface because of the high energetic ions etching at relatively low (room) temperature, while the surface of the powders will not be chemically altered by the physical method. In this work, SmCo₅ nano-flakes were prepared by oleic acid (OA) assisted ball milling technique, and then Argon cold plasma was used to clean the OA from the SmCo₅ flakes' surface on a homemade facility. The results show that the remaining carbon atoms can be removed effectively by Ar plasma. Good magnetic properties can be retained in the SmCo₅ flakes when the plasma power, Ar pressure, and cleaning time were properly chosen.

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