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Characterization of pre-molten SnLi/Sn by surface techniques and ICP-OES. Effects induced during its interaction with stainless steel, molybdenum and tungsten substrate A DE CASTRO, S STEMMLEY, M SZOTT, C MONIYHAN, T SPILA, K SUBEDI, D ANDRUCZYK, D.N. RUZIC, University of Illinois, CENTER FOR PLASMA MATERIAL INTERACTIONS, UNIVERSITY OF ILLINOIS, URBANA-CHAMPAIGN IL TEAM — The employment of liquid metals as plasma facing components in nuclear fusion reactors supposes an alternative to the traditional use of refractory high Z materials such as tungsten. Within the liquid metals approach to the problem, the use of tin-lithium alloys could combine the advantages of using the most usual pure liquid metals: tin (Sn) and lithium (Li), For this purpose, the University of Illinois has started an extensive experimental campaign in order to synthetize the material, characterize it and study its interaction with stainless steel, molybdenum and tungsten. The first depth profile characterization by Time of Flight-Secondary Ion Mass Spectrometry (SIMS-ToF) of SnLi samples, previously molten is presented in this work. Additionally, the composition of the alloy specimens was absolutely quantified by using ICP-OES in order to check the reproducibility of the alloy synthesis process. The surface characterization was extended to additional techniques as SEM and profilometry in order to shed light on the observed effects. The preliminary results indicated high reproducibility in the absolute composition of the alloy by ICP-OES, thus demonstrating a proper synthesis process, also showing no influence of the interaction with the substrate and melting on the alloy post-mortem composition. On the other hand, SIMS-ToF corroborated the presence of Sn and Li on the pre-molten samples, pointing out a stronger interaction of the alloy with stainless steel compared to tungsten and molybdenum.

Alfonso De Castro
University of Illinois

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