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**Influence of tin-lithium alloy composition on basic liquid plasma facing material characteristics** ALFONSO DE CASTRO CALLES, CODY MOYNIHAN, STEVEN STEMMLEY, DANIEL ANDRUCZYK, DAVID RUZIC, University of Illinois at Urbana-Champaign — Lithium is considered the most promising Liquid Metal (LM) option to be used as a PFC material due to its unique characteristics as a plasma-material boundary. However, there are intrinsic drawbacks (high vapor pressure and hydrogen retention) motivating the investigation of tin-lithium (SnLi) alloys that may have greater benefits but also ameliorating the problems. In this work, studies to determine feasible alloy candidates for flowing LM PFCs are explored. Different key issues have been studied, including topics such as wettability, compatibility of the alloy with material substrate and stability/homogeneity of the liquid surface depending on the alloy composition, focusing on the behavior of eutectic mixtures whose long-term stability would be in principle favored. These trials will elucidate if liquid surface instabilities and/or droplet ejection, that may cause a drawback when using just tin based LM components, are also present with the alloy. Material characterization techniques such as 3D, SEM as well as EDXS among others, combined with image processing tools have been utilized. The results of this investigations focusing on future perspectives and possible optimum scenarios for the eventual testing of the alloy will be addressed.

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