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Seebeck Coefficient of Lithium and Lithium-Tin Alloys L. KIRSCH, P. FIFLIS, D. ANDRUCZYK, D. CURRELI, D.N. RUZIC, University of Illinois at Urbana Champaign — Experiments into the viability of lithium as a first wall material in a fusion device have shown that it offers great benefits in reducing recycling of hydrogenic species at the wall, increasing energy confinement times, and gettering impurities. However, concerns have been raised about its practicality in regions of high heat fluxes, and one of the greatest is whether or not a lithium divertor concept can function at high steady state temperatures without significant evaporation of the lithium. Lithium-tin alloys might offer a solution by suppressing evaporation, but their performance in a TEMHD driven device such as the LIMIT device under development at UIUC is directly dependent on their thermoelectric properties, namely their unknown Seebeck coefficient. In support of the use of lithium-tin alloys in such a device, experiments are performed to recover the Seebeck coefficient of several different compositions of lithium-tin alloys. Experiments previously performed at the University of Illinois of the Seebeck coefficient of lithium [1] were confirmed and expanded upon by this study. Values of ranging from 12 +/-1 uV/K at 82C to 28 +/-1 uV/K at 240C were obtained.

[1] V. Surla et al. Journal of Nuclear Materials 415 (2011) 18-22.

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