HIGHLY SIDEROPHILE ELEMENTS IN UREILITES. K. Rankenburg[1*], M. Humayun[1], A. D. Brandon[3], and J. S. Herrin[3], [1]Freie Universität Berlin, Institut für Geologische Wissenschaften, Malteserstrasse 74-100, 12249 Berlin, Germany [*correspondence: rankenburg@yahoo.de] [2]National High Magnetic Field Laboratory and Dept. of Geological Sciences, Florida State University, Tallahassee, FL 32310, USA. [3]NASA Johnson Space Center, Mail Code KR, Houston, TX 77058, USA

The abundances of the highly siderophile elements (HSE) Ru, Pd, Re, Os, Ir, and Pt were determined by isotope dilution mass spectrometry for twenty-two ureilite bulk rock samples, including monomict, augite-bearing, and polymict lithologies. The CI-normalized HSE abundance patterns of all ureilites except ALHA 81101 show marked depletions in the more volatile Pd, with CI chondrite-normalized Pd/Os ratios (excluding ALHA 81101) averaging 0.19 ±0.23 (2). This value is too low to be directly derived from any known chondrite group. Instead, the HSE bulk rock abundances and HSE interelement ratios in ureilites can be understood as physical mixtures of two end member compositions. One component, best represented by sample ALHA 78019, is characterized by superchondritic abundances of refractory HSE (RHSE – Ru, Re, Os, Ir, Pt), but subchondritic Pd/RHSE, and is consistent with residual metal after extraction of a S-bearing metallic partial melt from carbonaceous chondrite-like precursor materials. The other component, best represented by sample ALHA 81101, is RHSE-poor and has HSE abundances in chondritic proportions. The genesis of the second component is unclear. It could represent regions within the ureilite parent body (UPB), in which metallic phases were completely molten and partially drained, or it might represent chondritic contamination that was added during disruption and brecciation of the UPB. Removal of carbon-rich melts does not seem to play an important role in ureilite petrogenesis. Removal of such melts would quickly deplete the ureilite precursors in Re/Os and As/Au, which is inconsistent with measured osmium isotope abundances, and also with literature As/Au data for the ureilites.