CHRONOMETRY AND REDOX STATE OF THE ANGRITE PARENT BODY AS INFERRED FROM Hf-W ISOTOPIC DATA. A. Markowski[1], G. Quitté[1], T. Kleine[1], M. Bizzarro[2], A. J. Irving[3], A.N. Halliday[4]. [1]Inst. for Isotope Geochemistry & Mineral Resources, ETH-Zürich, Switzerland. E-mail: markowski@erdw.ethz.ch. [2]Geological Inst., Univ. of Copenhagen, Denmark, [3]Dept. of Earth and Space Sciences, Univ. of Washington, Seattle, USA, [4]Dept. of Earth Sciences, Univ. of Oxford, UK

Introduction: The ^{182}Hf-^{182}W isotopic system is commonly used to date early planetesimal metal-silicate differentiation because it has an appropriate half-life of 8.9 Myr and Hf and W are strongly fractionated during differentiation. Hafnium is strongly lithophile, whereas W is moderately siderophile in a reducing environment. However, the chemical properties of W are different under oxidizing conditions and W becomes more lithophile. According to ^{26}Al-^{26}Mg and U-Pb data [1, 2] angrites are very ancient basaltic achondrites that have differentiated ~3 Myr after CAIs formation. These achondrites can potentially be used to intercalibrate different chronometers based on short- and long-lived radionuclides [e.g. 3], because they cooled quickly. They can also be used to study the redox conditions of early planetesimal formation. After a first report on this topic [3], we further investigated the Hf-W isotopic systematics in mineral separates from Sahara 99555 and are in the process of generating pure mineral separates from Northwest Africa 2999.

Chronology: In addition to our previous measurements of Sahara 99555, we obtained Hf-W data for a >230 m fraction which is enriched in feldspars, for fines, and for an acid-washed 80-150 m fraction. We also analyzed a whole rock and fines from another piece of Sahara 99555. All data plot on an isochron with an initial ^{182}Hf/^{180}Hf of ~7.3 10^{-5} and an initial $_{W}$ of ca. –2.1. The difference in slopes of Sahara 99555 and Allende CAIs isochrons [4] yields a time interval of ~5 Myr, in good agreement with the ^{26}Al-^{26}Mg age obtained for mineral separates for Sahara 99555 [2,5,6], but sligthly younger than ^{26}Al-^{26}Mg model ages inferred from whole-rock angrite samples [2]. Average Hf/W ratios obtained for whole-rocks from Sahara 99555 and Northwest Africa 2999 are ~5 and ~3.5, respectively. We thus inferred from Sahara 99555 a model dependent core formation age for the angrite parent body between 1.7 and 2.8 Myr after Allende CAIs.

Redox conditions: Using similarity in the bulk silicate solid/liquid distribution coefficients for Th and W, we recalculated the Hf/W ratios of the silicate reservoirs of D'Orbigny (~8), Sahara 99555 (~5), Angra dos Reis (~2), Northwest Africa 2999 (~2) [7, unpublished data]. These Hf/W ratios are lower than those calculated by Halliday [8] for the eucrite parent body, the Earth and the Moon, suggesting that oxidizing conditions may have prevailed for at least some early planetesimals during core-mantle segregation.

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