**I-XE SYSTEMATICS OF BRACHINITE-LIKE ULTRAMAFIC ACHONDRITE NORTHWEST AFRICA 5400.**

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**Introduction:** The ungrouped brachinite-like achondrite NWA 5400 is a relatively oxidized, metal-bearing ultramafic stone with terrestrial O and Cr isotope composition [1-4]. A comprehensive petrographic, elemental and multi-isotopic study of NWA 5400 and paired NWA 5363 suggested that the mineral assemblage in these meteorites represents a restite after partial melting and extraction of a small amount of silicate from a fertile source rock within ~ 1.5 Myr of the start of the solar system [5]. U-Pb systematics suggested very early differentiation, consistent with evolution of some parent bodies of iron meteorites [6]. Mn-Cr systematics indicated that $^{53}$Mn fully decayed at the time of isotopic closure [7]. Here we report I-Xe data for mineral phases separated from NWA 5400.

**Experimental:** In situ laser analyses on a polished section of NWA 5400 indicated the presence of multiple $^{129}$Xe rich mineral phases potentially suited for I-Xe dating, consistent with previous results for the whole rock [8]. To prepare mineral separates the meteorite was gently crushed, sieved into grain sizes between 37 and 74 μm and magnetically separated using a Frantz Isodynamic Magnetic Separator at progressively higher current settings. Troilite grains were manually removed from separates after each run. The final fraction, non-magnetic at 1.8A, consisted of mixture of forsteritic olivine and apatite. Aliquots of all samples were saved for mineralogical studies. The resulting 8 samples and absolute age standard Shallowater were sealed under vacuum in quartz tubes and irradiated with thermal neutrons to convert $^{127}$I into $^{128}$Xe, receiving ~ $2\times10^{19}$n/cm$^2$. Samples were wrapped in Pt, the xenon was extracted by stepwise heating in a low blank W-coil and analyzed by high-transmission mass spectrometry. Hot blanks were measured at temperatures ~ 100 °C higher than melting of Pt and were consistently atmospheric in composition.

**Results:** Two separates were analyzed so far. Olivine/apatite yielded an apparent high-temperature isochron corresponding to closure of I-Xe system 6.6 ± 0.5 Ma before Shallowater, and to an absolute age of 4568.9 ± 0.6 Ma (assuming a Shallowater age of 4562.3 ± 0.4 Ma [8]), within the Pb-Pb age of CAI (4568.2 ± 0.2 Ma [9]). This age may reflect the time of partial differentiation suggested by [5]. The I-Xe system in troilite closed ~ 8 Ma later. Contrary to what was observed for Mn-Cr, the I-Xe system apparently survived the NWA 5400 parent body processing in at least some mineral phases, although the exact iodine-carrier phase has yet to be identified.

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