**IRON ISOTOPE COMPOSITION OF OLIVINE AND METAL FROM PALLASITES.**

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**Introduction:** Pallasites formed at the core-mantle interface of a differentiated asteroid and comprise a mixture of olivine and FeNi-metal with accessory minerals (e.g. troilite and schreibersite). Three parent bodies can be distinguished on the basis of O-isotopes [1,2], two of which are represented here: (1) Brenham and Imilac (Main group pallasites, PMG) and (2) Eagle Station (Eagle Station grouplet, PES). Similarity in features such as metal composition [e.g.3] and O-isotopes [2] indicate that PMG and IIIABs may share a common parent body.

**Analytical Procedures:** Samples were characterised using a Phillips XL-30 SEM and a Cameca SX-50 EMP. Dissolution follows a two step HF-$HClO_4$-HCl method and iron is separated using anion exchange chromatography [4]. $^{56}$Fe and $^{57}$Fe were measured on a MC-ICP-MS (IsoProbe) and are bracketed with IRMM-014 [4]. Errors are ±0.05‰ (2 ) for $^{56}$Fe and ±0.09‰ (2 ) for $^{57}$Fe.

**Results:** All samples lie on the mass fractionation line already described for chondrules [5] and other meteorite samples [6]. Olivine signatures are identical to each other within error ( $^{56}$Fe = -0.02 to -0.06‰ and $^{57}$Fe = -0.10 to -0.17‰), but metal separates fall between -0.28‰ (Brenham) to +0.16‰ (Eagle Station) for $^{56}$Fe and -0.44‰ to +0.13‰ for $^{57}$Fe. Thus, there is evidence of fractionation between metal and silicate components.

**Discussion:** IIIAB iron meteorites and pallasites may share a common parent body where IIIABs are early-crystallized solids and where pallasite metal derives from mixing of evolved IIIAB magma with early-crystallized core or mantle-residue solids [6]. Henbury (IIIAB iron) is isotopically light in comparison to pallasite metal; +0.18‰ ( $^{56}$Fe) lighter than Brenham and +0.62‰ ( $^{56}$Fe) lighter than Eagle Station [7]. This apparent heterogeneity may be due to variable inclusion contents. Alternatively, evolution of the metallic melt be accompanied by iron isotope fractionation? Certainly, magmatic and post silicate-metal mixing processes were complex, involving segregation of the IIIAB melt by km-sized dendrites [8], variable S content [8] and a highly evolved, oxidizing, magmatic gas phase which interacted with the pallasite components [6]. One or all of these processes could have had a bearing on the Fe-isotope compositions of the metal. Further analyses and investigation are underway.

**References:** [1] Boesenberg J.S. et al. (2000) *Met. Plan. Sci.* **35**, 757-69. [2] Clayton R.N. Mayeda T.K. (1996) *GCA* **60**, 1999-2017. [3] Scott E.R.D. (1977) *GCA* **41**, 349-360. [4] Mullane E. et al. (2003) Plasma Source Mass Spect. Roy. Soc. Chem. p.351-361. [5] Mullane E. et al. (2003) *LPSC* **XXXIV**, No. 1027. [6] Wasson J.T. & Choi B-G. (2003) *GCA* **67**, 3079-3096. [7] Mullane E. et al. (2002) *Met. Plan. Sci.* **37**, 105. [8] Haack H. & Scott E.R.D. (1993) *GCA* **57**, 3457-3472.