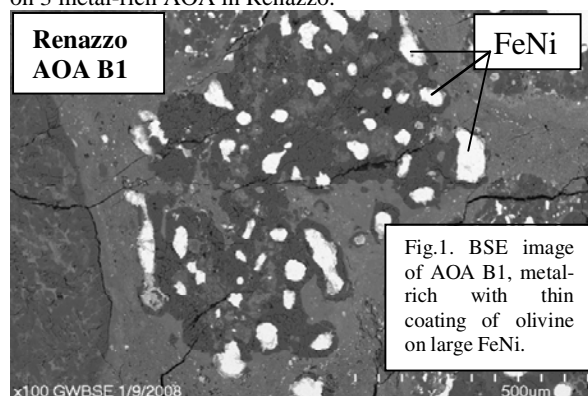


METAL-RICH OLIVINE AGGREGATES IN THE RENAZZO CR CHONDRITE.

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Introduction: Amoeboid olivine aggregates (AOA) are irregular-shaped, fine-grained aggregates of olivine (Ol) and refractory assemblages (anorthite, Ca-pyroxene, spinel, perovskite) [1-4]. AOA in CR's are particularly intriguing because some contain low-Fe, Mn-enriched (LIME) Ol similar to that in IDPs and Comets [5, 6] and some are metal-rich. AOA phases are ¹⁶O-rich consistent with a primitive origin, and formation from the same ¹⁶O-rich reservoir as CAIs [7]. Refractory minerals in CR AOA have ²⁶Mg excesses indicating ²⁶Al values as high as in CAIs suggesting they formed contemporaneously [7]. Here we report on 3 metal-rich AOA in Renazzo.



Results: We discovered three unusually metal-rich AOA in two small (cm-size) slabs of Renazzo using x-ray tomography. Slabs were cut to expose and polish surfaces for SEM, EMP, LA-ICPMS (trace element) and SIMS (O isotope) analysis. The AOA have highly irregular shapes and contain remarkable (50 μm-size) metal blebs surrounded by thin coatings of fine Ol (Fig. 1) and central Ca-, Al-rich assemblages of Ca-pyroxene, anorthite and/or MgAl spinel with tiny (μm-size) perovskite. Metal is up to 15 vol. %. The Ol in two AOAs has (wt. %) 0.6-1.8 FeO, 0.1-0.3 MnO and 0.02-0.3 Cr₂O₃. The other AOA (a2) has a high abundance of LIME Ol with 0.3-2.2 FeO, 0.1-0.6 MnO and 0.1-0.4 Cr₂O₃; some has Fe/Mn ratios of 1. Metal has 5-7 % Ni with solar Ni:Co. We are currently measuring O isotopes in Ol and trace elements in metal.

Discussion: These unusual AOA show minimal melting and are consistent with being aggregates of condensates. The metal was either captured by Ol, the Ol nucleated onto the metal or the metal formed by reduction of Fe from silicate. The latter hypothesis is unlikely and would require that the silicate was initially Fe (and Ni)-rich. Thus, the metal may be a primitive component incorporated into the inclusions.

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