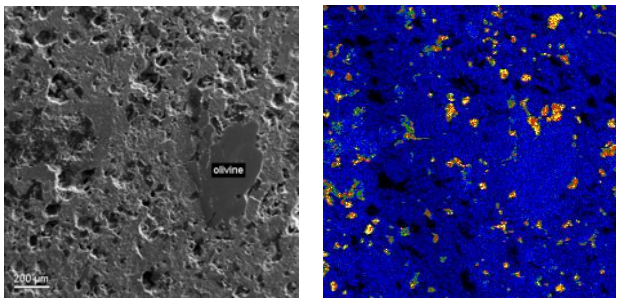
CHLORINE-RICH CARBONACEOUS COMPOUNDS IN ANOMALOUS CM2 CHONDRITE NORTHWEST AFRICA 3340 S. M Kuehner[1], A. J. Irving[1], D. Rumble, III[2] and P. P. Sipiera[3], [1]Earth & Space Sciences, University of Washington, Seattle, WA, kuehner@ess.washington.edu, [2]Geophysical Laboratory, Carnegie Institution, Washington, DC, [3]Planetary Studies Foundation, Galena, IL

This very fresh (W0), black, relatively fine-grained, porous stone (12.7 grams) probably is a recent fall judging from its shiny fusion crust (composed of dispersed magnetite and olivine grains + glass). The interior consists of sparse mineral grains, carbon-rich objects, dust-armored chondrules and rare CAI in a heterogeneous, very fine grained, porous matrix composed of bladed Fe-Mg-S-rich phyllosilicates (probably tochinilite-cronstedtite) with some primary calcite pentlandite and diamond. Normally-zoned olivine grains (up to 2 mm; range $Fa_{1.5\text{-}66}$) are armored by polycrystalline dust, and contain inclusions of Ni-rich troilite, chromite, millerite, kamacite and taenite. Some carbon-rich objects (up to 50 μm across) are pure graphite, but many are a chlorine-rich organic phase containing ~17 wt.% Cl and ~32 wt.% C, but no N and little O (Fig. 2). One small spherical CAI is composed of Mg-Al spinel with inclusions of perovskite.

Oxygen Isotopes: Analyses of acid-washed whole samples by laser fluorination gave, respectively, $\delta^{18}O$ = 0.494, 1.166; $\delta^{17}O$ = 6.224, 7.049; $\Delta^{17}O$ = -2.780, -2.542 per mil. These results plot within the field of CM chondrites [1].

Affinities: NWA 3340 appears to be an anomalous CM2 chondrite that contains unusually abundant halogenated carbonaceous compounds. Extractable chlorinated benzoic acids were reported [2] in other CM2 chondrites (Murchison, Orgueil, Murray and Cold Bokkeveld), but we doubt that the Cl-rich phases in NWA 3340 are such compounds. Nevertheless, it appears that various halogen-rich organic compounds (perhaps hydrocarbons and/or oxyacids) must have been present in the early solar nebula prior to accretion of the CM parent body or bodies.



SEI image of polished face *Chlorine X-ray map (bright)*

References: [1] Clayton R. N. and Mayeda T. K. 1999. *GCA* 63: 2089-2104; Moriarty G. et al. 2007. *LPS XXXVIII*, #1289 [2] Schöler H. et al. 2005. *Chemosphere* 60: 1505-1512.