MINERALOGY AND MATRIX COMPOSITION OF "CR" CHONDRITES RENAZZO AND EET 87770, AND UNGROUPED CHONDRITES ESSEBI AND MAC 87300

Michael E. Zolensky, Planetary Science Branch, NASA Johnson Space Center, Houston, TX 77058

I have characterized the fine-grained mineralogy of the matrix of two "CR" chondrites, Renazzo and EET 87770, and the ungrouped (but possibly related) chondrites Essebi and MAC 87300 using standard microprobe (focussed beam) and TEM techniques (using ultramicrotomed sections). I compare these results to those I have previously obtained for 31 other carbonaceous chondrites.

MATRIX COMPOSITION: The matrix composition of these four chondrites is similar to CM chondrites, with Essebi being at the Mg-rich end of the trend and MAC 87300 at the Fe-rich end (figure 1). Mg-Fe-Si matrix ratios are similar to CM, CO and CV chondrite matrix values, but S (2.4, 3.3, 2.6 and 1.9 wt% element for Renazzo, EET 87770, Essebi and MAC 87300, respectively) is significantly higher than for CVs or COs.

MATRIX MINERALOGY: The dominant matrix mineral for all four meteorites is olivine. However this matrix also contains abundant saponite and serpentine, with both minerals being identified on the basis of morphologies, lattice fringes and composition (but see below). As in the CI chondrites, these two phyllosilicates are locally intergrown such that individual compositional analyses are impossible to obtain. Figure 2 compares the composition of these mixed phyllosilicates to serpentine and saponite from chondrites and interplanetary dust particles (IDPs). These phyllosilicates are significantly finer-grained than they are in CI matrix (Serpentine: <0.12 um maximum crystal thickness for the four vs. <0.25 um for CIs; Saponite: <0.07 um maximum crystal thickness for the four vs. <0.3 um for CIs). This mineralogy and phyllosilicate grain-size of these four chondrites is most similar to some saponite class IDPs [1].

MATRIX PARAGENESIS: As for the CI chondrites, the parent bodies of Renazzo, EET 87770, Essebi and MAC 87300 (probably hydrous, outer belt asteroids) have experienced aqueous alteration to a maximum temperature of approximately 150°C [2], based upon the phyllosilicate assemblage and lack of tochilinite. The diminutive grain size of these phyllosilicates and abundance of olivine in the matrix indicates that this aqueous alteration episode was non-pervasive and brief. The abundant metal and sulfides in these meteorites indicates that fO2 was low and fS2 high. These conditions were apparently similar on the parent bodies of many saponite class IDPs.

REFERENCES: [1] Zolensky and Lindstrom (1991) *Proc. 22nd Lunar Planet. Sci. Conf.*, submitted; [2] Zolensky et al. (1989) *Icarus 78*, 411-425.

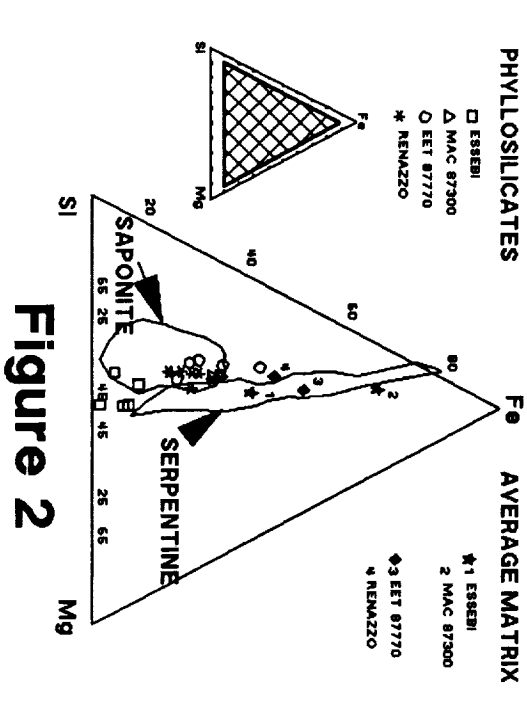

Figure 2

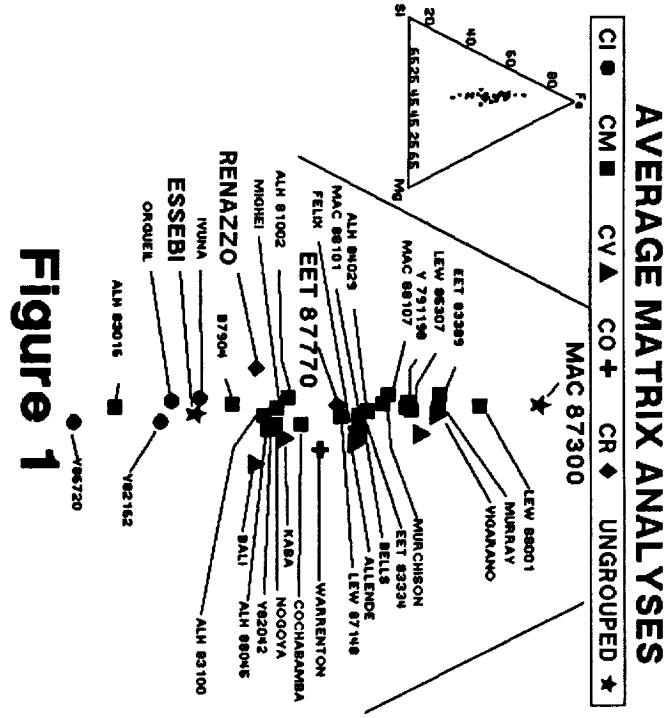

Figure 1