PETROLOGY, MINERALOGY AND MAGNETIC SUSCEPTIBILITY OF LARGE EL4 ENSTATITE CHONDRITE NORTHWEST AFRICA 10952. S. M. Kuehner[1], A. J. Irving[1,2], P. P. Sipiera[2] and C. M. Hollis [1]Dept. of Earth & Space Sciences, University of Washington, Seattle, WA 98195, USA (irvingaj@uw.edu), [2]Planetary Studies Foundation, Galena, IL, USA.

Introduction: A large (17.2 kilogram) stone recovered in northwest Africa in 2005 and recently acquired by the Hollis Collection has been confirmed to be an EL4 chondrite. This specimen is one of only 17 known EL4 chondrites and by far the largest. Here we describe the petrologic, mineralogic and magnetic characteristics of this remarkable specimen.

Figure 1. *Whole Northwest Africa 10952 stone. Photo by C. Sipiera.*

Petrography: Well-formed RP chondrules (apparent diameter 500-1800 µm, mean 800 µm) are set in a relatively coarse grained matrix containing prismatic enstatite grains and partly altered metal. Apart from predominant enstatite ($Fs_{0.4\text{-}1.2}Wo_{0.5\text{-}0.6}$), accessory minerals include diopside ($Fs_{0.2}Wo_{47.8}$), Si-poor kamacite (Si 0.20-0.21 wt.%, Ni 5.5-5.9 wt.%, Co 0.43-0.50 wt.%), sodic plagioclase ($Ab_{84.5}An_{12.9}Or_{2.6}$), intermediate plagioclase ($An_{55.7}Ab_{43.0}Or_{1.3}$), daubreelite, troilite, schreibersite and oldhamite (partly altered to gypsum).

Magnetic Susceptibility: Magnetic susceptibility was measured in triplicate on a 133 gram endcut piece using an SM30 meter and gave a logχ value of 4.87 ($\times 10^{-9}$ m^3/kg).

Figure 2. *Cut interior surface showing well-formed chondrules and relatively abundant fresh metal.*

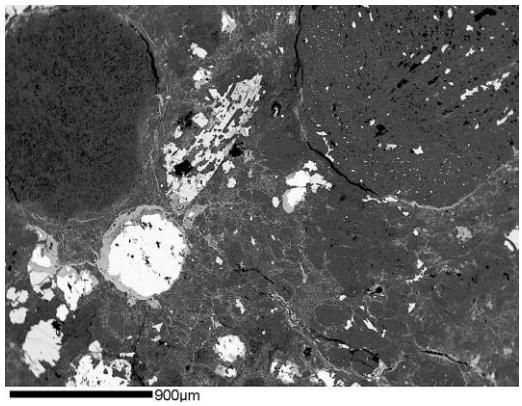

Figure 3. *BSE image showing spherical chondrules, altered kamacite (bright) and a composite grain (upper center) composed of troilite+sodic oligoclase.*

Discussion: EL3 and EL4 chondrites are relatively rare meteorites (with a total of only about 30 known unpaired specimens), and like all enstatite chondrites possess unusual mineralogic and chemical features [1]. Even though the proximal source for these rocks may be a body now residing in the asteroid main belt, there has been speculation [2, 3] that the original parent body may have accreted closer to the orbit of Earth (based on shared oxygen isotopic compositions) or even much closer to the Sun.

References: [1] Rubin A. (2008) *LPS* **XXXIX**, #1114 [2] Javoy M. (2010) *EPSL* **293**, 259-268 [3] Ebel D. and Alexander C. (2011) *Planet. Space Sci.* **59**, 1888-1894.