**WEATHERING OF METEORITES FROM OMAN: THE INFLUENCE OF SOIL CHEMISTRY AND CORRELATION OF CHEMICAL/MINERALOGICAL WEATHERING PROXIES WITH $^{14}$C TERRESTRIAL AGES.** A. Al-Kathiri[1,2], B. A. Hofmann[3], E. Gnos[1], A.J.T. Jull[4], [1]Institut für Geologie, Universität Bern, Baltzerstrasse 1, CH-3012 Bern, Switzerland, [2]Directorate General of Commerce and Industry, Ministry of Commerce and Industry, Salalah, Sultanate of Oman, [3]Naturhistorisches Museum der Burgergemeinde Bern, Bernastrasse 15, CH-3005 Bern, Switzerland, [4]NSF Arizona AMS Laboratory, University of Arizona, 1118 East Forth St, Tucson AZ 85721, USA

**Introduction:**
During three meteorite field search seasons in Oman (2001-2003) approx. 150 individual meteorites were recovered plus several strewnfields (>3000 stones were collected from a single strewnfield). 141 soil samples were collected from different regions in the Oman interior desert. Two types of soil samples were collected, soil under meteorite (SUM) and reference soil samples (RSS) 10 m away from SUM. Meteorites and soil powders were subjected to major and trace element analysis using combination of INAA, ICP-MS, and ICP-OES. The same set of samples was analyzed for $^{14}$C.

**Analytical results and discussion:**
The measured $^{14}$C terrestrial ages of investigated meteorites is in the range of 2.2 to >49 Kyr with many ages between 10 and 40 Kyr. The older meteorites generally are more weathered. Meteorites from the same strewnfield may have different weathering grades depending on burial conditions and the size of the meteorite. Comparing the meteorites color powders with the rock color chart show that meteorites with lowest weathering grade are represented by dark gray color (N3) and meteorites with high weathering grade are commonly represented by light brown colors (5 YR 6/4). Comparing the chemical analyses of the investigated meteorites with mean compositions of H and L chondrites [1] enrichments of Sr and Ba are most prominent. Both elements are positively correlated with $^{14}$C age and weathering grade.
Geochemical analyses demonstrated that the soil chemistry is very homogeneous all over the interior Oman desert and largely independent of the region or the bed rock lithology (all bed rocks are flat lying marine and lacustrine limestones [2]). Comparing the bulk soil (RSS) geochemistry with the average composition of the upper continental earth crust [3] showed that the soil samples are strongly enriched in Cr with significant enrichments of Ni and Se. SUM samples are more strongly enriched in Ni than the RSS, indicating leaching of Ni from the meteorites. Heavy mineral separation and microprobe analysis showed that ophiolite-derived chromite is an abundant soil constituent, Ni in RSS samples possibly has the same source.

**References:** [1] Mason B. (1971) *Handbook of elemental abundances in meteorites*. [2] Le Métour J. et al. (1995) *Geology and mineral wealth of the Sultanate of Oman*. Ministry of Petroleum and Minerals, Muscat. [3] Taylor S.R. and McLennan, S.M. (1985) *The Continental Crust: its Composition and Evolution*. Blackwell.