A DATABASE OF IRON METEORITE ELEMENTAL ABUNDANCES. Nina Hooper[1] and Martin Elvis[2], [1]Harvard University (ninahooper@college.harvard.edu), [2]Harvard-Smithsonian Center for Astrophysics (60 Garden St., Cambridge MA02138 USA, melvis@cfa.harvard.edu).

Introduction: The study of meteorites provides us with a window to the composition and formation of the asteroids from which they are derived. Analyses of trace elements have highlighted the variety within the iron asteroids, particularly in richness of asteroids in precious metals, in particular the platinum group elements (PGEs). As highly siderophile, or "iron-loving", elements (HSEs), PGEs play an important role in developing theories of planet formation and there may be much to gain from mapping their distribution within asteroids. This high abundance of PGEs, amongst other things, also makes asteroids an important target for establishing a commercial market in space.

To better visualize the distribution of trace element abundance across different classes of iron meteorites we have compiled a database of over 700 Fe meteorites that provides abundance data for up to16 trace elements.

Data Aggregation: To compile the database of meteorite concentrations we scraped data from 21 papers from 1967-2003. Of the ~1150 known iron meteorites, this database includes a total of 708 meteorites, with an additional 30 pallasites. The data come from neutron activation of samples placed near nuclear reactors.

The earliest papers reported data for only Ni, Ga and Ge. These results were not included here. Papers that contain data pertaining to PGE-bearing iron meteorites became more numerous after 1980. In particular, measurements of iridium concentration were developed first and as a result, these values are available for all meteorites listed. Least frequently are concentrations of palladium (Pd), (Ru) and (Rh) which are each only reported for the same 119 meteorites.

The completion rate of this database is ~45%, as a large number of values are missing because earlier papers were more selective in their reporting.

Database contents:

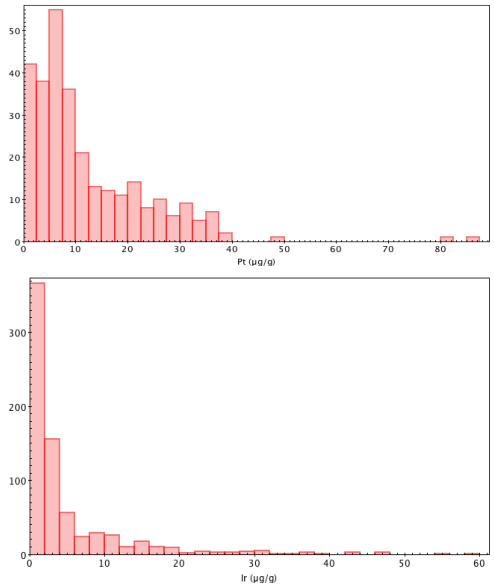
The database gives the name, structural type and chemical group of each meteorite. They are organized by chemical group, for Ni, Cr snd Co in units of mg/g and trace elements Cu, Ga, Ge, As, Sb, W, Re, Au, Pt, It, Os, Pd, Ru and Ru. Where applicable, the uncertainties associated with measurements were included.

The database is stored in excel format and will be available at the CfA web site (www.cfa.harvard.edu) soon.

Discussion: Our primary area of investigation involving this database has so far been the distribution of PGEs, in particular platinum (Pt) and iridium (Ir). We produced the following histograms, that describe the frequency of Pt and Ir, respectively, in bins of 2µg/g.

While the data is not complete, this database has already proven to be a useful tool in mapping trace element abundances against each other in 2- and 3-dimensions. (Not shown.)

We encourage contributions to this database and hope that it will highlight gaps within the current literature that may be worthwhile filling.



References:

[1] Wasson J.T. (1967), *Geochimica et Cosmochimica acta*, Vol 31, 161-180.

[2] Wasson J.T. et al. (1988), *Geochimica et Cosmochimica acta*, Vol 62, 715-724.

[3] Hoashi et al., (1993). Chemical Geology, 106, 207-218.