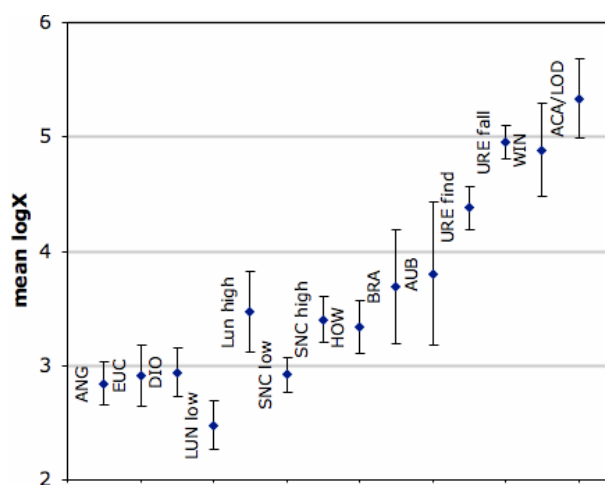


MAGNETIC CLASSIFICATION OF ACHONDRITES.

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Low-field magnetic susceptibility (χ) provides a rapid and non-destructive way to classify ordinary chondrites into the LL, L and H groups, based on non overlapping range of metal amount [1]. Most non-ordinary chondrites groups also show a narrow range of χ values, except C2, CM and CV [2]. The total number of achondrite specimens currently in our database is 641; these are from 221 different meteorites, after tentative pairing of hot and cold desert ones. The use of magnetic susceptibility measurement as a classification tool in achondrites is not as straightforward as in the case of chondrites that show well-defined value both at the scale of the individual meteorite and of the meteorite group. All achondrites, except unbrecciated ureilites, show significantly larger dispersion at the meteorite scale, with respect to chondrites. We infer that this is typical of magmatic processes, which produce larger heterogeneities in modal mineralogy at the cm-scale, compared to the accretionary processes in chondrites. The dispersion observed in ureilites at the meteorite scale, smaller than in any chondrite group, suggests an original petrogenetic process responsible for the metal distribution, post-dating magmatic processes. One can distinguish low and high magnetic subgroups in lunar (non-regolith and regolith material, respectively) and martian meteorites (pyrrhotite- and magnetite-bearing, respectively [3]). On average the achondrites groups can be ranked as shown below according to increasing susceptibility (in $10^{-9} \text{ m}^3/\text{kg}$). However, in most of the groups can be found one or two anomalous meteorites that can be one order of magnitude less or more magnetic than the average (computed excluding the anomalies).



References: [1] Rochette P. et al. 2003. *Meteoritics & Planetary Science* 38:251-268 [2] Rochette P. et al. 2006. *Meteoritics & Planetary Science* 41:5074 [3] Rochette P. et al. 2005. *Meteoritics & Planetary Science* 40:529-540.