

METEORITES AND THE PARENT MATERIAL OF THE EARTH.

H. Palme and J. Zipfel. Senckenberg, Forschungsinstitut und Naturmuseum, 60325 Frankfurt/M, Senckenberganlage 25, palmeherbert@gmail.com

Based on stable isotope systematics there are two groups of chondritic meteorites: CC-carbonaceous and NCC-non-carbonaceous chondrites [1]. Differentiated meteorites follow the same trends, either they belong to CC or NCC. It has been suggested that NCC formed inside and CC outside Jupiter orbit [2]. Chemistry shows a similar dichotomy. Isotopically Earth belongs to NCC, but chemically to CC. Bulk Earth is enriched in refractory and depleted in moderately volatile elements [3]. Earth is the largest reservoir of solid material in the terrestrial planet region. But this material is not represented by meteorites. Enrichment of refractories and depletion of volatiles typical of Earth could be achieved by massive removal of gas during condensation from a gas of solar composition. NCC type meteorites, in particular enstatite (EC) and ordinary chondrites (OC) would represent minor reservoirs depleted in early condensed refractory grains. This implies late formation of OC and EC. These meteorites groups are not building blocks of Earth, but leftovers after formation of Earth material.

References: [1] Warren P. (2011) EPSL 311, 93-100. [2] Gerber S. et al. (2017) *Astrophys. J. Lett.* 841, L17; [3] Palme H. & O'Neill H.St.C. (2014) In: Holland H.D. & Turekian K.K. (eds.) *Treatise on Geochemistry*, Second Edition, vol. 3, pp. 1-39, Elsevier.