The Santa Rosa Meteorite from Colombia: An example of critical raw materials in a meteorite

Franziska D.H. Wilke¹, Barbara Bsduk², Uwe Altenberger², and Ana E. Concha³

¹GFZ German Research Centre for Geosciences, Telegrafenberg, 14473 Potsdam, Germany (fwilke@gfz-potsdam.de)
²University of Potsdam, Institute of Geosciences, Karl-Liebknecht Str.24-25, 14476 Potsdam, Germany (altenber@uni-potsdam.de)
³Universidad Nacional de Colombia, Bogotá, Colombia

Meteorites, especially the undifferentiated ones like primitive chondrites, provide information about the origin and initial conditions of the solar system since they contain presolar and solar nebula materials (Scott, 2007). Differentiated meteorites like iron meteorites play a distinct role in constraining the early phases of planetary accretion (Yang et al. 2007). They also provide the possibility to receive information about core properties and planetary bodies. In addition to the gain in such fundamental scientific knowledge both types are of interest for the exploration of critical and precious elements (CRMs).

In the future, the tremendous increase of the consumption of these elements from terrestrial deposits and the subsequent shortage could lead to an exploitation of extra-terrestrial deposits. Therefore, “space-mining” of near Earth objects could be used as alternative source of raw materials (Ross, 2001).

While improving the characterization and classification of the Santa Rosa de Viterbo Iron Meteorite, we found notable concentrations of Au and Ge alongside major elements such as Fe, Ni and Co in the bulk composition of that meteorite. Major and rock-forming minerals such as kamacite and taenite incorporate hundreds of ppm of Ge whereas schreibersite, itself a minor component in that particular meteorite, is a source for Au. In kamacite and taenite also Ir and Ga were found in minor amounts.
