

Graphite inclusions in Iron meteorite and their isotopic perspective in understanding the Early Solar system processes.

V. Goyal¹, Marhas K. K¹ and M. E. Varela².

¹Physical Research Laboratory, Ahmedabad, India

²ICATE-CONICET, San Juan, Argentina

Graphite found as inclusions in non-magmatic Iron meteorites formed by different crystallisation path, have shown to have a very distinct petrological association with the metal. These graphites are believed to have carried primordial composition and in many cases preserved it. Hence, these primitive achondrites serve as an important sample disclosing various early Solar system processes. To further our understanding related to the inclusions in iron meteorites, their formation and preservation of primordial composition, we analysed Carbon and Nitrogen isotopes in a few graphitic inclusions from Kendall County meteorite. Kendall County is a IAB-type iron meteorite, structurally hexahedrite having graphite inclusions which are distributed all over the meteorite surface with sizes ranging from submicron to hundreds of microns. Graphite inclusion in schreibersite and troilite from Kendall County were analysed using PRL nanoSIMS in multi collection mode including Ni-58 along with C and N isotopes. Inclusions indicate lighter $\delta^{13}\text{C}$ in graphite within the metal than the reported value for graphite embedded within silicate. The lower value of $\delta^{13}\text{C}$ also points out that the inclusion preserved the primordial composition, and probably the parent meteorite went through only partial melting temperatures.