

PRELIMINARY CHARACTERIZATION OF SAMPLES FROM THE CARANCAS (PUNO, PERU) METEORITE AND ITS CRATER

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Abstract

This paper reports the preliminary results of the elemental and structural characterization of meteorite and crater soil samples found in an uninhabited area near the village of Carancas, Puno Region, located approximately 1.300 km south of Lima, Peru. X ray fluorescence was used for the elemental characterization and for the structural characterization X-ray diffractometry (XRD) and transmission Mössbauer spectroscopy (TMS) were used. For the TMS analysis the 14.4 keV resonant nuclear transition in the natural isotope ^{57}Fe was used.

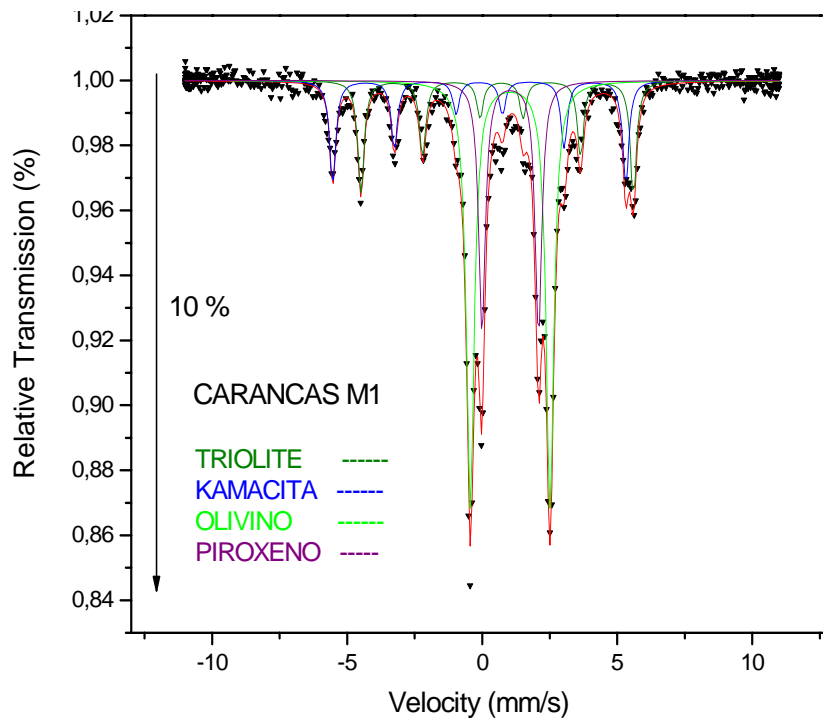
The XRF results help to differentiate the elemental composition of the meteorite samples from the soil samples from the crater. In the case of the meteorite samples it allows to identify the presence of sulphur, chlorine, chromium and nickel, which are not present in the soil samples.

The XRD results show the presence of the silicates such as pyroxene and olivine, and of the mineral troilite. Primary minerals such as quartz are not observed.

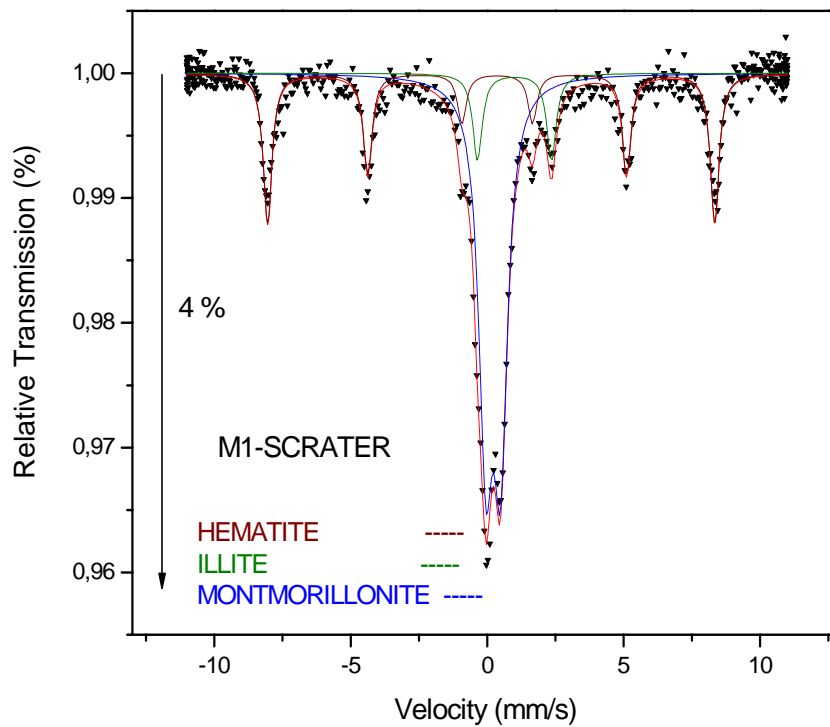
The analysis of the meteorite samples by TME shows the presence of two magnetic sextets assigned to kamacite (FeNi), which is the predominant metallic phase, and troilite (FeS), and two paramagnetic doublets assigned to pyroxene and olivine. In the case of the soil samples minerals such as hematite, illite and montmorillonite are observed.

In general terms, the results obtained with these different techniques complement each other reasonably well to characterize the samples gathered at the site.

Keywords: Mossbauer spectroscopy, X ray diffractometry, X ray fluorescence, meteorite, Carancas.



(a)



(b)

Figure1 Room temperature Mössbauer spectra for the Carancas M1 sample of Meteorite taken at (a) $v_o = 11$ mm/s, and (b) sample of soil of the Crater- M1-Scrater .