

PETROGRAPHY AND MINERALOGY OF LAVRAS DO SUL METEORITE

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We report on the petrography and mineralogy of a new Brazilian meteorite, Lavras do Sul, found in 1985 in the city of Lavras do Sul, Rio Grande do Sul State, Brazil. It was found standing out in a pebble field bed of a stream, near the homonymous city, by Professor Picada of the Geosciences Institute, UFRGS. The main mass of the meteorite is an individual piece measuring about 10 x 5 x 6 cm and weighting ~ 1 kg and is completely covered by a fusion crust. Its interior shows brown spots due to weathering. The investigated sample has 67g, and is deposited in the Museu Nacional in Rio de Janeiro. Due to the large similarity with Putinga meteorite fall a careful study was performed to exclude a paired possibility. The description is based on optical microscopy, microprobe analyses and Mössbauer spectroscopy. Optical investigation in transmitted polarized light shows some well defined chondrules and fragments dispersed in a recrystallized matrix. A chondritic texture is clearly defined, the chondrules revealed a variety of internal texture such as the nom porphyritic (BO, RP, C) and the porphyritic (POP),(GO). They are more or less outlined (sizes 0.5 to 2.0mm). Their shapes are elongated, rounded, subrounded, some are deformed and broken and concentrated in some areas of the thin sections. The matrix is recrystallized showing coarse crystals of silicates. The major minerals are the ferromagnesians, pyroxene and olivine, plagioclase grains (maskelynite and glass) partially isotropic, (sizes 0, 05mm to 0,6mm). Melt pockets are scarce and small. The accessories minerals are kamacite, taenite, tetrataenite, plessite and troilite. Kamacite is mostly polycrystalline, the plessite shows sometime pearlitic structure bordered with tetrataenite. Troilite is abundant and is mainly present as single grains. Minor oxides, magnetite and chromite, are present around some metal grains. Veins of secondary iddingsite penetrate along the olivine and some pyroxene cracks. Microprobe analyses reveal a mean composition of olivine (Fa_{24,9}) and low-Ca pyroxene (Fs_{22,6}). The Lavras do Sul meteorite is classified as an L5. The mean composition of olivine and pyroxene are within the range of equilibrated L-group chondrites. The type-5 is based on poorly delineated chondrule boundaries, on the occurrence of very few clinopyroxene and the presence of large plagioclase grains (up to 200 µm) [1]. The mechanical deformations indicate the stage of shock metamorphism to be S3-S4[2]. From the observed features the degree of weathering should be classified as W₁ [3]. The new Brazilian meteorite Lavras do Sul, is an ordinary chondrite (L5); shock stage S3-4 and degree of weathering W1.

References: [1] *Geochimica et Cosmochimica Acta*, 31: 747-765 (1967). [2] *Geochimica et Cosmochimica Acta*, 55: 3845-3867 (1991). [3] *Meteoritics & Planetary Science* 28(3):460 (1993).