MINERALOGY AND PETROGRAPHY OF THE L6 CHONDRITE RIO DO PIRES, BRAZIL. M. E. Zucolotto[1] and L. L. Antonello[1], Departamento de Geologia e Paleontologia - Museu Nacional/UFRJ – RJ, Brazil (zucolotto@acd.ufrj.br)

Introduction: A single stone meteoritic mass, of 118g, almost entirely covered by fusion crust, was found by a student of Prof. H. Shigame from Universidade Federal da Bahia; near the city of Rio do Pires (13º 07.40' S., 42º 17.31' W.). It was then donated to Mr. W. Carvalho. A slice weighing 12g was permuted with Museu Nacional of Rio de Janeiro. The meteorite was registered and classified by Brearley in Met. Bull 77 [1]. No description of this meteorite was published so far.

Materials and Methods: The following notes on mineralogy and texture are based on the study of four polished thin section, the samples were studied optically by transmitted and reflected light and electronically by SEM/EDS and EPMA**.**

Results: a broken sample shows a light gray color and fine matrix with few visible chondrules, shock veins and few patches with areas of brown color and metal points. The crust is black with an average thickness of 0.3mm and covers almost completely the external surface.

It displays poorly defined chondritic textures. Most of the chondrules are broken and appear as fragments; only very, few display well-defined rounded or elongate shapes. Appear as fragments ranging from 0.3 to 5mm in diameter. The opaque minerals occur as interstitial and as inclusion in the chondrules.

Mineralogically it consists of essential olivine $Fa_{25.53}$, pyroxene $Fs_{21.85}$ $En_{76.7}W_{1.45,}$ kamacite with 0.8% Co, plessite, taenite and troilite; accessory plagioclase $Ab_{58.52}$ $An_{25.18}$ $Or_{16.30}$, daubrèelite, chromite and maskelynite; secondary hematite and goethite and/or lepidocrosite. Pyroxene, olivine, plagioclase and opaque minerals exhibit shock features as undulatory extinction and fractures.

The matrix shows highly recrystallized, with uniform crystalline material composed of olivine, pyroxene, opaque minerals, clear interstitial grains of plagioclase, maskelynite, secondary hematite, goethite and/or lepidocrosite.

The chondrules are poorly defined and present considerably variations in their internal texture; the majority is characterized as granular olivine-pyroxene, porphyritic olivine-pyroxene and radial pyroxene.

Polished sections etched by nital 2%, show opaque phases composed of: zoned taenite grains with an outer rim of 1-10μm of tetrataenite followed by cloudy taenite and the interior is formed by martensite or, fine grained plessitic or a combination of both. Some well-defined plessite grains are also present; kamacite is common with Neumann bands or in sometimes recrystallized.

Troilite occurs as isolated grains or in contact with kamacite or taenite. Under quite crossed polars it appears that all grains in the same field have the same anisotropic extinction. Only very few large troilite nodules exhibits a slight mosaicism. The presence of melt pockets is also common.

Discussion: Based on the composition of its constituent minerals and chemical data, particularly of olivine $Fa_{25.5}$ and Co 0,8% in kamacite and pyroxene $Fs_{21.8}$, it belongs to the L-group. By the textural features in special homogeneity of kamacite and the presence of poorly defined chondrules, it was classified as petrologic type 6. According to the shock nomenclature for ordinary chondrites [2], it was previously classified as S6 [1]. Although the absence of planar deformation features, the presence of plane fractures and undulatory extinction in olivine, the presence of maskelynite and plagioclase in the sample are characteristic of shock stage <S5. As proposed by [3] the opaque phases such as FeNi metal and troilite should also shock classify chondrites. In Rio do Pires, troilite with only slight mosaicism, the presence of martensite, Neumann at kamacite and undisturbed taenite indicate a shock stage ≤ S4 and lead to the conclusion that the Rio do Pires has a shock stages S3 or S4 instead of S6.

References: [1] Wlotzka F. (1994) – Met. Bull. 77. *Meteoritics 29*, 891-897. [2] Stöffler D. et al (1981) *Geochim. Et Cosmochim. Acta 55*, 3845-3867. [3] Bennett III M.E and McSween Jr H.Y. *Meteoritics & Planet. Sci., 31*, 255-264.