

CHEMICAL AND MINERALOGICAL COMPOSITION OF THE LIMESTONES AND BLACK SHALES FROM IRATI FORMATION, RIO CLARO, BRAZIL

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The Irati Formation is a marine geologic unity into Paraná Basin. This work shows the chemistry and mineralogy of the dolomitic limestones and black shales from this formation (Permian), at Rio Claro (SP), Brazil, on using Optical Microscopy, X-Ray Diffraction, X-Ray Fluorescence and Differential and Gravimetric Thermal Analysis (DTA and TGA).

The results of the Optical Microscopy show a relatively homogenous dolomitic limestone, with microfossils, microcrystals, micritic matrix and quartz veins.

The X-Ray Diffraction reveals, for the dolomitic limestone, a mineralogy constituted by dolomite, calcite, quartz and plagioclase. The most abundant minerals are chlorite and illite. The black shale presents quartz, pyrite, hematite and plagioclase. The most common clay minerals are chlorite, illite and kaolinite.

The X-Ray Fluorescence data for the dolomitic limestone define similar amounts of CaO and MgO, the most abundant oxides, low amounts of SiO₂, Al₂O₃, Fe₂O₃ and almost null amounts of Na₂O and K₂O. LOI is about 42%. For the black shale, the most abundant oxides are SiO₂ and MgO, whereas Al₂O₃ and Fe₂O₃ are about 5% and CaO, Na₂O and K₂O are present in very low amounts. LOI is about 12%.

The thermal behavior of the dolomitic limestone is very simple: two strong exothermic peaks. For the black shale, there is a triple low temperature peak, three exothermic peaks and one weak endothermic peak.