

Supplementary material III: Laboratory specifications

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Post-Cretaceous Brittle Tectonics in the Tunas Alkaline Complex, Paraná, Brazil

Taily Ferreira Santos Farias, Eduardo Salamuni, William Rudolf Lopes Peyerl, Viviane Barbosa Gimenez

Procedures used for mineralogical analysis by X-ray diffraction (translation of LAMIR-UFPR procedures in 2016) are summarized below.

1) Mineralogical analysis by X-Ray Diffraction (*XRD*)

-Equipment

-X-ray diffractometer, PANalytical brand, EMPYREAN model, with X'Celerator detector;

- X' Pert High Score Plus interpretation software, PDF-2 database.

- Preparation of the sample:

Total powder - Drying / Quartering (30 grams) / milling (30 grams) / confection of the pressed tablet of the powder (not oriented) / qualitative analysis / comparison with PDF - 2 database. Scanning range 3.0 - 70° 2 theta.

Treatment for identification of clay minerals (groups) -

quartering (50 grams) / sample disaggregation (10 grams), addition of Na pyrophosphate (0.5 grams) and shaking with deionized water (100 mL) / standing in the beaker / collection of the supernatant after 2 hours / deposition of the material (Natural) / reading of calcined lamina at 550 °C for 2 hours (MU) / reading of solvated lamina with ethylene glycol after 6 hours (EG) / qualitative analysis / comparison of the treated diffractograms. Scanning range 3.0 - 30° 2 theta.

Read conditions for *XRD*

3.0 - 70 ° 2 theta (total dust analysis)

3 - 30 ° 2 theta (analysis of the treated slides).

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|---------------------------|---------|
| Step Size [°2Th.] | 0.02 |
| Scan Step Time [s] | 10 |
| Anode Material | Cu |
| K-Alpha1 [Å] | 1.54060 |
| Generator Settings 30 mA, | 40 kV |