



## **Multi-technique analysis to estimate the maximum temperature reached in a burned Red-Yellow Latosol in the Southern Amazon**

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Knowing the maximum temperature reached in soil during burning is important to evaluate fire intensity. It is of utmost importance to predict fire effects on soil properties and avoid damaging environmental systems. Spectroscopic methods combined with multivariate statistics may provide soil chemical and mineralogical information. This study aims at predicting the maximum temperature reached in a Red-Yellow Latosol from an Amazonian region in Brazil. Energy dispersive X-ray fluorescence (EDXRF) was employed to acquire chemical data. The concentration of the elements and the spectral data were analyzed using Principal Component Analysis (PCA) and Partial Least Squares regression (PLS). In addition to EDXRF, some other analyses were performed: thermal analysis, Munsell color chart, magnetic susceptibility, X-ray diffraction (XRD) and visible and near-infrared spectroscopy (Vis-NIR). Estimated temperatures ranged from 325 to 608°C, a temperature range which has been reported elsewhere. Considering the instrumental advantages and results, the employment of spectroscopic techniques such as EDXRF combined with multivariate analysis has proved to be a feasible alternative technology to evaluate fire effects in the soil.