

## POTENTIALITIES OF RAMAN SPECTROSCOPY FOR THE NONDESTRUCTIVE IDENTIFICATION OF ESSENTIAL MINERALS IN MARTIAN METEORITES

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**This paper shows the possible detection of the constituent minerals in Martian meteorites, through the Raman technique**

Meteorites are fragments of extraterrestrial materials that provide information of the numerous processes that have taken place in the Solar System. Mars has been examined for years through telescopes, and although we have learned much about the geological features and history of this planet, the gap in our knowledge certainly exceed what we understand. Meteorites are of great importance because they can be analyzed in laboratories, providing a great deal of information from asteroids and even planetary bodies such as Mars and the Moon.

Thus, one way to obtain important information about Mars is through meteorites from the red planet (Nascimento-Dias et al. 2020). These meteorites are excellent materials to understand Mars present and past, as they possess physical and chemical characteristics of the planetary evolution preserved in their structures.

The aim of this work is to show the potential that the Raman spectroscopy technique has in the detection of minerals in Martian meteorites. Here we will prioritize the presentation of data related to the detection of essential minerals (Figure 1), in other words, those considered indispensable for the definition, characterization and classification of a meteorite (Nascimento-Dias et al. 2021a).

Therefore, the methodology of this work will be developed through the Raman technique, which is a

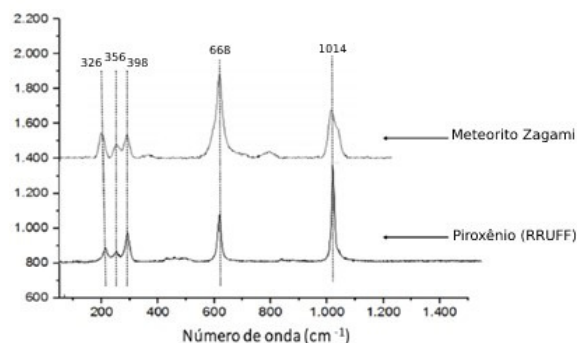


Fig. 1. Representative spectrum of comparisons between sample and reference spectrum for mineral identification.

high spatial resolution technique that provides, in a fast and non-destructive way, information about the molecular vibrational modes of the sample, obtaining the chemical and mineralogical composition (Nascimento-Dias et al. 2021b). Thus, allowing the study and analysis of the constituent minerals of these Martian meteorites.

### REFERENCES

- Nascimento-Dias, B. L., Zucolotto, M. E., Belgo, H. C., et al. 2020, *IJAsB*, 19, 438  
Nascimento-Dias, B. L., Caique, R., Mayato, B., et al. 2021, *Vibrational Spectroscopy*, 115, 103259  
Nascimento-Dias, B. L., Donato, T. P., Zucolotto, M. E., et al. 2021, *JRSp*, 52, 1206

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