

Magnetite signature of representatives pyrenean peridotite bodies

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Peridotites are among the rocks with the highest potential for native hydrogen production during the serpentinization process. Serpentinization is also accompanied by the production of magnetite, a ferromagnetic mineral that can be identified by indirect geophysical methods. A better understanding of the processes that lead to the formation of magnetite will therefore enable us to better constrain the origin of magnetic anomalies, and hence the extension of serpentinization in the earth's mantle.

We propose a magnetic study of 3 Pyrenean peridotites (Lherz, Turon de la Técoûère TT, Sarail  ) that we consider representative of the processes leading to magnetite formation.

At Lherz, the degree of serpentinization is very low ($\%S < 10$) and very little magnetite is detected. On the other hand, in sedimentary breccias containing peridotite clasts, we can observe magnetite concentrations up to 0.1%. In the Sarail   peridotites, where the degree of serpentinization reaches up to ~100%, we find up to 8% magnetite. In the TT peridotites, the percentage of magnetite is <0.3% in the protomylonites, and can exceed 1% in the mylonites.

These observations are set out in an evolutionary scheme, which will enable us to better constrain the native hydrogen production potential of Pyrenean peridotites.

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