

## **Petrophysical properties of peridotite samples from several lenses in the Pyrenean zone: evaluation of reservoir properties and degree of maturation of a source rock for H<sub>2</sub> production.**

Nadjib Chibati, Yves Géraud, Marc Diraison

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22 outcrops of subcontinental peridotite lenses along the North Pyrenean Zone are sampled to determine their petrophysical properties. Are characterized their mineralogical composition (mainly the serpentinite content) and several petrophysical properties: porosity, permeability, densities, compressional and shear wave velocities, and thermal conductivity and diffusivity. The percentage of serpentine varies between 5 and 97% from fresh samples to totally altered ones. The serpentinization induces mineralogical changes and a wide variation of the physical properties. The porosity increases from few percent up to 20% while the density decreases from 3.2 g.cm<sup>-3</sup> for fresh peridotite to 2 g.cm<sup>-3</sup> for totally serpentinized peridotites. Compressional and shear wave velocities range from 7200 to 3000 m.s<sup>-1</sup> and from 3600 and 1700 m.s<sup>-1</sup> respectively. Thermal conductivity and diffusivity range from 4.2 and 1.9 W.m<sup>-1</sup>.K<sup>-1</sup> and from 1.7 mm<sup>2</sup>.s<sup>-1</sup> to 0.6 mm<sup>2</sup>.s<sup>-1</sup>. Permeability ranges over 4 orders of magnitude, these variations depend also on the pore network geometry. These data sets are used to build several reservoirs models depending on the alteration levels and thus on their maturation level for H<sub>2</sub> production. These data are used to build several reservoir models for these peridotite formations based on alteration levels, but also to determine their level of maturation for H<sub>2</sub> production.

### **Références**

Chibati, N., Geraud, Y. Essa, K. (2022).- Petrophysical characterization and thermal conductivity prediction of weathered peridotites. *Geophysical Journal International*, 231, 1786-1805, <https://doi.org/10.1093/gji/ggac288>.

Nadjib Chibati  
GeoRessources, Université de Lorraine  
[nadjib.chibati@univ-lorraine.fr](mailto:nadjib.chibati@univ-lorraine.fr)

Yves Géraud  
GeoRessources, Université de Lorraine  
[yves.geraud@univ-lorraine.fr](mailto:yves.geraud@univ-lorraine.fr)