

Water storage in Ca-clinopyroxene with depth, an experimental study

N. BOLFAN CASANOVA^{1*}, T. POISSONNEAU¹ AND
D. NOVELLA¹

¹Laboratoire Magmas et Volcans, 5 rue Kessler, 63038
Clermont-Ferrand, France (*correspondence:
N.Bolfan@opgc.univ-bpclermont.fr)

These last years, a considerable progress has been obtained in the knowledge of how Nominally Anhydrous Minerals (NAMs) store water as a function of the various thermodynamic and chemical variables. The water storage capacity of olivine and orthopyroxene is quite well known and that of garnet is under consideration. Still, we know nothing about the effect of depth on the storage of water in calcic clinopyroxene. The result is very important because clinopyroxene is the most water-rich NAMs that is observed in cratonic xenoliths and could have the same contribution as olivine to the total water storage capacity.

We thus performed multi-anvil experiments at pressures of 3 to 9 GPa and 1200 to 1350°C in multi-component peridotitic system in the form of sandwich experiments. The aim is to constrain the effect of pressure and temperature on the water storage in Ca-clinopyroxene. The water contents have been measured with FTIR and Raman spectroscopy depending on the grain size.

The results will provide constraints on the partitioning of water between clinopyroxene and olivine as a function of depth and allow to definitely fix the water storage capacity of the mantle in the peridotite-H₂O system.