

# **In situ analysis of major and trace elements of hydrous silicate minerals and glasses by laser ICPMS: The effect of water**

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Various types of hydrous silicate minerals are commonly found in the earth's crust and mantle, which may contain important information on fluid transport in subduction zones and metamorphic processes. These were analysed by laser ablation ICPMS to assess their potential as geochemical tracers and to study the potential effect of variable water on the laser ablation measurements.

Flamigini et al (2014) [1] studied the effect of carrier gas humidity on the vaporization of laser-produced aerosols in inductively coupled plasmas, which suggests that minerals and glasses with variable water contents could behave differently during laser ablation. Therefore, we prepared six glasses each of three bulk compositions (andesitic, dacitic, and rhyolitic) containing between 0 and 9% water to test the effect of water on the ICPMS signal intensity. The results show that intensities are enhanced by up to 30% in glasses with higher water contents (up to 8% water) for most of elements. The intensity ratio (isotopes/<sup>29</sup>Si) was not significantly modified below 5% water. To test this effect further we present results of measurements for a series of compositionally homogeneous natural mineral samples with largely variable water and trace element contents: clinopyroxene, amphibole, epidote, talc, chlorite and antigorite (with increasing water content). Our assessment is based on comparing LA-ICP-MS, microprobe and solution-ICP-MS measurements.

[1] Flamigini, L., J. Koch, and D. Günther, The effect of carrier gas humidity on the vaporization of laser-produced aerosols in inductively coupled plasmas. *Journal of Analytical Atomic Spectrometry*, 2014. **29**(2): p. 280-286.