FTIR imaging: A powerful technique in mineralogy and geochemistry

G. DELLA VENTURA

Dipartimento di Scienze, Università Roma Tre, L. San Leonardo Murialdo 1, I-00146 ROMA

In the last decades the availability of solid-state array of detectors revolutionized the fields of molecular spectroscopy and chemical imaging. 2D Focal Plane array (FPA) nowadays allow the acquisition of thousands of IR spectra simultaneously and generate mid-IR images with high resolving power [1]. For Earth Science materials, these imaging capabilities have been used to address features such as configurational changes of structurally-bound molecular species (e.g., CO_2 *vs* CO_3) [2], or zoning of water in minerals and NAMs during the crystal growth [3]. Such features, which are barely accessible with conventional micro analytical techniques, may provide constraints on the conditions of formation of the samples, and on the evolution of geological systems *vs.* time. This presentation is aimed at showing and discussing novel applications of infrared imaging, with particular emphasis to the distribution and speciation of H and C in experimentally treated samples (e.g. Fig. 1), where characterization of the zoning of the target molecules is mandatory to model diffusion processes [4-6].

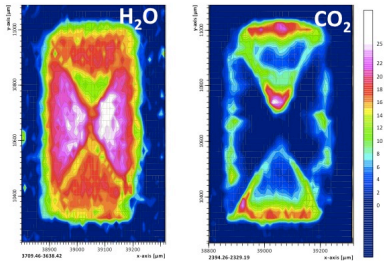

Figure 1 Diffusion patterns of H_2O and CO_2 in synthetic beryl

[1] Della Ventura et al. (2014) RIMG 78, 447-479. [2] Della Ventura et al. (2007) Am Min 92, 713-721. [3] Della Ventura et al. (2008) Am Min 93, 1538-1544. [4] Radica et al. (2015a) Am Min submitted. [5] Radica et al. (2015b) Am Min submitted. [6] Della Ventura et al. (2015) Chem Geol submitted.