Geophysical Research Abstracts
Vol. 14, EGU2012-7971, 2012
EGU General Assembly 2012

Raman spectroscopy of graphitic carbons in the Earth Sciences: review and novel applications

O. Beyssac
CNRS IMPMC Paris, France (olivier.beyssac@impmc.upmc.fr)

Graphitic materials are widespread in terrestrial rocks and meteorites, where they span a wide range of structure/chemistry from amorphous-like compounds to crystalline graphite. They have an important role in many geological processes like fluid-rock interactions, diagenesis/metamorphism or fossilization in which they may be actors or act as tracers. Raman spectroscopy is widely used to characterize graphitic materials of geological interest with implications in cosmochemistry, geobiology or geology. The Raman spectrum of graphitic materials has actually unique specificities with the presence of the so-called defect bands, and these specificities may be (cautiously) used to characterize their structure and retrieve some information of geological relevance. Phenomenological relations between in-plane crystallites size La and the ID/IG peak intensity ratio will be discussed, including their theoretical background and applicability to geological graphitic carbons. Recent methodological developments from the Raman analysis to the spectra processing will be reviewed. Novel applications of Raman spectroscopy of graphitic carbons in petrology or sedimentology (provenance studies) will be presented. Altogether, advantages/limits of Raman spectroscopy of graphitic carbons point to the necessity for multiscale and interdisciplinary studies to properly characterize graphitic carbons and retrieve optimal geological information.