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Spectroscopic analysis of calcite and dolomite marble using laser induced breakdown spectroscopy

S Saleem, M Abrar, M Fahad and I Ahmad

COMSATS Institute of Information Technology, Pakistan

Laser induced plasma spectroscopy is employed to study the effect of laser irradiance on the marble samples collected from North-West region of Pakistan and determine the elemental composition of these samples. A pulsed Q-switched Nd:YAG laser with fundamental and second harmonics in conjunction with the LIBS 2000 detection system were used to ablate the sample surface to produce the plasma and record the spectra of radiation emitted. The spectra show different elements including calcium, magnesium and sodium whereas lines emitted by Ca are dominating. The electron temperature of the plasma produced was determined by Boltzmann Plot Method and electron number density was determined from the broadening of spectral lines using Stark broadening. The plasma plume generated at the surface of the samples is studied by varying the laser energy from 15mJ to 40mJ and distance along the plume length from the surface of the sample from 0.0mm to 1.0mm. It is observed that the electron temperature and number density are increased with increase of laser irradiance and decreased with the distance from the sample surface.

Biography

Sania Saleem is 22 years old. Is currently a student doing Masters of Science in Astronomy and Astrophysics from Institute of Space Technology, Islamabad. Completed Bachelors of Science in Physics from Comsats Institute of Information Technology. Interested in the field of laser physics and will prefer P.HD in the field of laser Physics. She has done project on Laser Induced Plasma Spectroscopy of commercially available Brass and is currently doing research work on Laser induced plasma spectroscopy of Nanomaterials and have submitted a research paper on Spectroscopic Analysis of Calcite and Dolomite Marble using Laser Induced Breakdown Spectroscopy.

saniasaleem93@hotmail.com
m.abrar@comsats.edu.pk
fahad@ciit.net.pk

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