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Characterizing laser-induced plasma generated from MgO/PVA solid targets*

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Received November 04, 2018
Revised February 04, 2019
Accepted February 22, 2019

This contribution reports on the characterization of laser-induced plasma generated from the surface of magnesium oxide dispersed in Poly (vinyl alcohol) (MgO/PVA) pellet using laser induced breakdown spectroscopy. For this purpose, Nd:YAG Q-switched pulsed laser with energy ranging from 50 to 250 mJ, operating at both fundamental (1064 nm) and second harmonic (532 nm) was focused on the sample to generate plasma. Based on experimental results, emission lines of magnesium have been used to calculate the plasma parameters. The plasma electron temperature as a function of laser energy ranged from (8596−8900) K and (8000−8700) K, and the electron density from $(1.12-1.8)\cdot 10^{16}\,\mathrm{cm}^{-3}$, $(2.9-4.5)\cdot 10^{16}\,\mathrm{cm}^{-3}$ measured at 1064 nm and 532 nm, respectively. Although these values increased with the increase in laser irradiance, they showed different rates of increase with different wavelength dependency.

DOI: 10.21883/OS.2019.07.47943.336-18

* Полная версия статьи опубликована в английской версии журнала.