
Time evolution of the infrared laser ablation plasma plume of SiO

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The optical emission spectroscopy of the ablation plume from a material is a useful tool to study the dynamics of species formed in this process [1]. Ablation of silicon monoxide targets permits the synthesis of films with different properties and structures. After CO₂ laser ablation of SiO targets, formation of Si nanocrystals takes place on the SiO surface [2]. A better understanding of the mechanisms of the SiO laser ablation plume, can provide control on the properties of the final deposition products. In this work the Laser Induced Breakdown Spectroscopy (LIBS) was applied to study the time dependence of different parameters that define the plasma plume. This plume was rich in atomic, strongly ionized and molecular excited species as SiI, SiII, SiIII, SiIV, OI, OII, OIII, OIV or SiO. Stark-broadened profiles of some lines of SiII were used for calculate the electronic density, n_e , the ionization degree was also stimated. Time of Flight (TOF) measurement of some plasma species allowed to calculate the time evolution of such species as well as the time dependence on their velocity distribution. Plsama plume inage and 2D spectral image were taken to undestand the temporal behaviour.

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References

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