

STUDY OF LASER PRODUCED PLASMA OF LIMITER OF THE ADITYA TOKOMAK FOR DETECTION OF MOLECULAR BANDS

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The tokamak wall protection is one of the prime concerns, and for this purpose, limiters are used. Graphite is commonly used as a limiter material and first wall material for complete coverage of the internal vacuum vessel surfaces of the tokamak. From the past few years, we are working to identify and quantify the impurities deposited on the different part of Aditya Tokamak in collaboration with the Scientists at Institute of Plasma Research, Ahmedabad, India using Laser Induced Breakdown Spectroscopy (LIBS) [1-3]. Laser induced breakdown spectroscopy (LIBS) spectra of limiter of Aditya Tokamak have been recorded in the spectral range of 200-900 nm in open atmosphere. Along with atomic and ionic spectral lines of the constituent elements of the limiter (1-3), LIBS spectra also give the molecular bands. When a high power laser beam is focused on the sample, laser induced plasma is produced on its surface. In early stage of the plasma Back ground continuum is dominated due to free-free or free-bound emission. Just after few nanoseconds the light from the plasma is dominated by ionic emission. Atomic emission spectra is dominated from the laser induced plasma during the first few microsecond after an ablation pulse where as molecular spectra is generated later when the plasma further cools down. For this purpose the LIBS spectra has been recorded with varying gate delay and gate width. The spectra of the limiter show the presence of molecular bands of CN and C₂. To get better signal to background ratios of the molecular bands, different experimental parameters like gate delay, gate width, collection angle and collection point (spatial analysis off the plasama) of the plasma have been optimized. Thus the present paper deals with the variation of spectral intensity of the molecular bands with different experimental parameters. Keywords: Limiter, Molecular bands, C₂, CN.

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