

STARK BROADENING OF NEUTRAL ARGON LINES IN PLASMAS

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Stark broadening of twelve neutral argon lines has been experimentally studied. This study is performed to obtain new and reliable data of Stark broadening parameters (widths and shifts of the lines and ion-broadening parameter A). Some of the studied lines has not been measured before. As a plasma source wall-stabilized arc operated with 99 % Ar - 1 % H₂ mixture under atmospheric pressure, was used. In order to avoid possible radiative transfer problems when radiation is recorded end-on, plasma observation was performed side-on. The other reason for side-on observation was to obtain relatively wide range of plasma electron density (0.74×10^{16} - 2.9×10^{16} cm⁻³) and temperature (9300 - 10800 K). For the shift measurements Geissler tube was used as a reference plasma source.

Attention was paid on precise spectral intensity measurements (with the error < 1%) and wavelength settings (within 0.0025 nm). Recorded profiles were Abel inverted and then precise numerical procedure for line separation and deconvolution was applied.

Obtained results for width and shift measurements are presented and compared with the theoretical ones and experimental results of other authors when they were available.