

STARK BROADENING OF Ar I SPECTRAL LINES  
 EMITTED IN SURFACE WAVE SUSTAINED DISCHARGES

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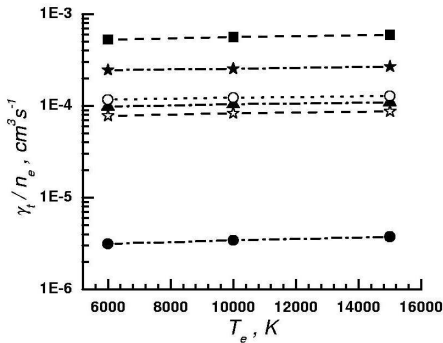
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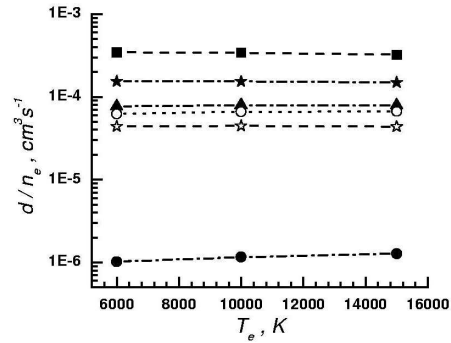
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The Stark parameters (the widths and shift) of six Ar I spectral lines in pure argon: 522.1, 549.6, 603.2, 518.8, 560.7 nm ( $nd \rightarrow 4p$ , for  $n = 7 \div 5$ ) and 696.5 nm ( $4p' \rightarrow 4s$ ) have been calculated within the semi-classical perturbation approach [1-3].

Surface wave's discharges (SWDs) have been successfully employed in various fields of science and technology, including materials processing, elemental analysis, abatement of harmful gases, and more recently, sterilization of medical devices. Operating at atmospheric pressure we have used emission spectroscopy to determine the electron density of SWDs from the Stark broadening of the emitted argon lines [4].



**Fig. 1.** The ratio of the total width to the electron density ( $n_e = 10^{14} \text{cm}^{-3}$ ) as a function of the electron temperature  $T_e$  for the studied Ar I lines (■ 522.1, \* 549.6, ○ 518.8, ▲ 603.2, \*560.7, ● 696.6 nm)



**Fig. 2.** The ratio of the shift to the electron density ( $n_e = 10^{14} \text{cm}^{-3}$ ) as a function of the electron temperature  $T_e$  for the studied Ar I lines (■ 522.1, \* 549.6, ▲ 518.8, ○ 603.2, \*560.7, ● 696.6 nm)

## References

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