STARK BROADENING OF DOUBLE
IONIZED ATOMS : As III AND Se III

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1. INTRODUCTION

Stark broadening data for multple ionized atom spectral lines are needed for astrophysical modeling of stellar and laboratory plasma. Stark broadening mechanism is the main pressure broadening mechanism in hot stars with $T_{eff} \gtrsim 10000$ K. Sometimes Stark broadening mechanism may be important for cooler stars, e.g. for lines originating from energy levels with large principle quantum numbers. Consequently providing of Stark broadening parameters for a large number of transitons for many atoms and ions is of interest. Here we present our calculation for Stark widths of double ionized As and Se spectral lines.

2. RESULTS

For calculation, the modified semi-empirical approach developed by Dimitrijević and Konjević (1980) has been used. Energy level data needed for calculation have been taken from Moore's tables (1971) and oscillator strengths taken from Migdalek (1976). In Table 1 we present results of our calculations of Stark widths for four As III and three Se III spectral lines. For these ions there are no experimental Stark broadening data for comparison.

Table 1 Stark full width (FWHM) of As III and Se III spectral lines. The electron density is $10^{23} \mathrm{m}^{-3}$. The avaraged wavelength of the multiplet is denoted by $\overline{\lambda}$.

Transition	T (K)	W (nm)
As III $\overline{\lambda} = 95.5$ nm $4p^2 P^0 - 5s^2 S$	5000.	.216E-02
	10000.	.151E-02
	20000.	.106E-02
	30000.	.865E-03
	40000.	.753E-03
	50000.	.681E-03

Table 1, continued

Transition	T (K)	W (nm)
As III $\overline{\lambda} = 86.4$ nm $4p^2P^0 - 4d^2D$	5000.	.608E-03
	10000.	.423E-03
	20000.	.291E-03
	30000.	.235E-03
	40000.	.203E-03
	50000.	.183E-03
As III $\overline{\lambda} = 396.1$ nm $5s^2S - 5p^2P^0$	5000.	.573E-01
	10000.	.401E-01
	20000.	.280E-01
	30000.	.228E-01
	40000.	.200E-01
	50000.	.182E-01
As III $\overline{\lambda} = 702.5$ nm $4d^2D - 5p^2P^0$	5000.	.128
	10000.	.893E-01
	20000.	.621E-01
	30000.	.505E-01
	40000.	.441E-01
	50000.	.401E-01
Se III $\overline{\lambda} = 381.5$ nm $6s^3P - 6p^3D$	5000.	.170E-01
	10000.	.119E-01
	20000.	.823E-02
	30000.	.667E-02
	40000.	.580E-02
	50000.	.526E-02
Se III $\overline{\lambda} = 353.4$ nm $6s^3P - 6p^3P$	5000.	.155E-01
	10000.	.108E-01
	20000.	.754E-02
	30000.	.624E-02
	40000.	.555E-02
	50000.	.513E-02
Se III $\overline{\lambda} = 327.1$ nm $6s^3P - 6p^3S$	5000.	.134E-01
	10000.	.935E-02
	20000.	.659E-02
	30000.	.550E-02
	40000.	.493E-02
	50000.	.459E-02

References

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