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**Disorientation of the Ne$^*$(2p$_i$ [J=1]) atoms due to He atom collisions in glow discharges at 10 K $<$ T $<$ 3000 K** CRISTIAN BAHRIM, Department of Chemistry and Physics, Lamar University, VAIBHAV KHADILKAR, Department of Computer Science, UT Dallas — We calculate the disorientation of the Ne$^*$(2p$_i$ [J=1]) atoms in a wide temperature range using a quantum close-coupling many-channel approach and the model potential for the interaction between Ne$^*$(2p$_i$ [J=1]) and He $(1s^2)$ atoms in a gaseous mixture at thermal equilibrium proposed in [1]. Comparison with experiments of disorientation of the Ne$^*$(2p$_2$) atoms [2] for 17 K $<$ T $<$ 300 K is reported, and excellent agreement is found above 35 K. Below 35 K our rate coefficients are larger than the experimental data from [2]. The difference is possibly due to a stronger influence of the nuclear rotational motion in the molecular Hamiltonian than the electrostatic interaction at large atomic separation. This assumption is in agreement with our analysis of disalignment of the Ne$^*$(2p$_i$ [J=1]) atoms done in [3], but is in disagreement with the measurements of depolarization at low temperatures reported in [2]. We explain the variation of the disorientation rates with the temperature based on the anisotropy of the collisional channels associated to the Ne$^*$(2p$_i$ [J=1]) states. [1] Bahrim C and Khadilkar V V 2009 *Phys. Rev. A* **79** 042715. [2] Nimura M, Hasuo M and Fujimoto T 2004 *J. Phys. B. At. Mol. Opt. Phys.* 37 4647. [3] Bahrim C and Khadilkar V V 2008 *J. Phys. B: At. Mol. Opt. Phys.* **41** 035203.

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