

Abstract Submitted
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Depolarization of Ne*(2p_i [J=1]) atoms induced by collisions with He(1s²) at 10 K < T < 3,000 K CRISTIAN BAHRIM, VAIBHAV KHADILKAR, Department of Chemistry and Physics, Lamar University - Texas — Depolarization mechanisms of Ne*(2p⁵ 3p; 2p_i [J=1]) atoms induced by collisions with helium in a gas mixture at thermal equilibrium are analyzed using a close-coupling quantum method within a model potential approach [1]. Our goal is to explain measurements of alignment destruction (which is a mechanism that includes the disalignment and the depopulation of atoms) [2], disorientation [3], and disalignment [4] of Ne*(2p_i[J = 1]) atoms induced by He-Ne collisions at 10 K < T < 3,000 K using the density matrix formalism. Such analysis offers accurate information about anisotropic atom-atom potentials and improves our model potential for the HeNe*(2p⁵3p) system [1] by adding the polarizability of Ne* atoms on various 2p_i states to the long-range potentials. Our results for neon excited on the 2p₂, 2p₅, 2p₇ and 2p₁₀ states are reported, and excellent agreement with available measurements [2, 3, 4] is found. Also the atomic polarizabilities for Ne* on 2p₂, 2p₅, 2p₇ and 2p₁₀ states are reported. [1] Bahrim C, Kucal H and Masnou-Seeuws F 1997 *Phys. Rev. A* **56** 1305. [2] Carrington C G and Corney A 1971 *J. Phys. B* **4** 869. [3] Seo M, Shimamura T, Furutani T, Hasuo M, Bahrim C and Fujimoto T 2003 *J. Phys. B* **36** 1885. [4] Nimura M, Hasuo M and Fujimoto T 2004 *J. Phys. B.* **37** 4647.

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