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Collisional Radiative Recombination $Ar^+ + e + e$ at low temperatures from 77K to 180 K R. JOHNSEN, University of Pittsburgh, T. KOTRIK, P. DOHNAL, R. PLASIL, S. ROUCKA, P. JUSKO, J. GLOSIK, Charles University, Prague — The extremely strong ($T^{-4.5}$) temperature variation of collisional radiative recombination (CRR) makes it difficult to extend experimental tests of the frequently used "Stevefelt formula" to low temperatures, since the electron temperature must be precisely known and CRR adds heat to the electron gas. Using a newly developed low-temperature helium-buffered flowing afterglow (Cryo-FALP), we have determined CRR rate coefficients for of Ar^+ ions with electrons at electron temperatures from 77 K to 180 K at electron densities n_e from 10^8 to 10^{10} cm^{-3}. The measured ternary rate coefficient K_{CRR} at 77 K of $(1.0 \pm 0.4) \times 10^{-17}$ cm^6s^{-1} and the observed variation with electron temperature T_e agree well with the $T_e^{-4.5}$ dependence predicted by the Stevefelt formula

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