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Electron swarm coefficients for H_2O and H_2O-N_2[1] A.M. JUAREZ, ICF-UNAM, E. BASURTO, J.L. HERNANDEZ-AVILA, Universidad Autonoma Metropolitana-A, C.B.I., J. DE URQUIJO, ICF-UNAM — We have used a pulsed Townsend technique to measure the electron drift velocity v_e, the density normalized longitudinal diffusion coefficient ND_L, and effective ionization coefficient $(\alpha - \eta)/N$, in water vapour and water vapour-nitrogen mixtures over the density-reduced electric field range E/N, 16-650 x 10^{-17}V cm^2. The v_e values are in good agreement with previous ones, while those for ND_L agree well with a previous calculation. The limiting value for E/N was found to be E/N_{lim}=137 x 10^{-17} V cm^2. For E/N<70x10^{-17} V cm^2, the v_e curves lie below that for pure N_2; however, the 10% H_2O-N_2 curve for v_e shows the trend for negative differential conductivity. The $(\alpha - \eta)/N$ curve for H_2O shows a shallow, negative minimum, in disagreement with a recent measurement using the steady-state Townsend technique. The H_2O-N_2 curves for $(\alpha - \eta)/N$ show a progressively smaller minima, together with a trend to lower values of $(\alpha - \eta)/N$ as the N_2 content in the mixture increases. This research aims to provide a complete set of self-consistent electron swarm parameters for the simulation of flue-gas discharges.

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A.M. Juarez
amjuarez@gmail.com
ICF-UNAM

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