

## MOLECULAR ION DOPPLER DRIFTS AND ION MOBILITIES IN A GLOW DISCHARGE

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The mobilities of a number of ions ( $\text{ArD}^+$ ,  $\text{N}_2\text{H}^+$ ,  $\text{SD}^+$  and  $\text{SD}^-$ ) have been studied on the basis of their Doppler shifts in a positive discharge column. The technique of infrared velocity modulation and precise microwave measurements<sup>a</sup> were employed to investigate the mobilities of spectroscopically identified ions over a broad range of E/N values in an argon buffer gas. For  $E/N > 100$  Td, the reduced mobilities exhibit substantial differences for particular ions which could not be explained using the classical Langevin and kinetic theories. The experimental results and a simple model based on influence of an inhomogeneous electric field will be presented.

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<sup>a</sup>S. Civiš, A. Walters, M. Yu. Tretyakov, S. Bailleux, and M. Bogey, *J. Chem. Phys.* 108, 8369 (1998).