MEASUREMENT OF THE PURE ROTATIONAL QUASIBOUND SPECTRA OF HeH^+ AND HeD^+ IN A LABORATORY PLASMA BY DIRECT LASER ABSORPTION

Z. LIU, W. Y. FAN and P. B. DAVIES, *Department of Chemistry, Uiversity of Cambridge, Cambridge CB2 1EW, UK.*

The pure rotational quasibound spectra of HeH^+ and HeD^+ have been observed in the mid infrared region using diode laser velocity modulation absorption spectroscopy. Four quasibound to quasibound($Q-Q$) and three bound to quasibound($B-Q$) transitions of HeH^+ and one bound to quasibound transition of HeD^+ have been detected in a low pressure ac glow discharge. The highest quasibound level involved in the spectra (HeH^+, v=0, J=26) is 2000 cm^{-1} above the dissociation limit. The measured transition frequencies are in very good agreement with *ab intio* calculations. Two of the $Q-Q$ transitions have wider linewidths due to lifetime broadening.