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

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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.