INVESTIGATION OF BORN-OPPENHEIMER BREAKDOWN IN HCl/DCl BY THRESHOLD ION-PAIR PRODUCTION SPECTROSCOPY (TIPPS)

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The spectroscopic technique Threshold Ion-Pair Production Spectroscopy (TIPPS)[a] is applied for the first time to the isotopomers HCl/DCl. From the high-resolution TIPP spectra, the difference between the equilibrium bond dissociation energies of the isotopomers can be measured to better than 1 cm^{-1}, and therefore an experimental estimate of the Born-Oppenheimer breakdown in the long range limit of the ground state potential curve is obtained. The experimental result from the present work is compared to a recent determination of the Born-Oppenheimer breakdown in HCl by Coxon and Hajigeorgiou.[b] If time permits, similar work that is in progress on HF/DF will also be discussed.

[a] J. D. D. Martin, J. W. Hepburn, Phys. Rev. Lett. 79, 3154 (1997).
[b] J. A. Coxon, P. G. Hajigeorgiou, J. Mol. Spectrosc. 203, 49 (2000).