INFRARED SPECTROSCOPIC EVIDENCE FOR ISOTOPOLOGS OF THE HOHOH ANION TRAPPED IN SOLID NEON

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Although properties of the HOHOH anion have long been sought, only recently have quantum chemical calculations converged on a centrosymmetric structure for it. One vibrational fundamental, the antisymmetric stretching motion of the central H atom along the OHO axis, has even more recently been identified in the gas phase [a]. In experiments involving the codeposition at 4.3 K of a Ne:O_2 mixture with a Ne:H_2 mixture that has been passed through a microwave discharge, this fundamental absorption appears very close to its gas-phase position. Experiments involving partial and full deuterium enrichment confirm the presence of multiple H atoms in the anion and provide the first observation of the corresponding fundamental of the fully deuterium-substituted species.

[a] E. G. Diken, J. M. Headrick, J. R. Roscioli, J. C. Bopp, M. A. Johnson, and A. B. McCoy, J. Phys. Chem. A 109, 1487 (2005).