HYPERFINE STRUCTURE IN THE PURE ROTATIONAL SPECTRA OF BISMUTH MONONITRIDE, BiN, AND BISMUTH MONOPHOSPHIDE, BiP

STEPHEN A. COOKE, JULIE M. MICHAUD AND MICHAEL C. L. GERRY, Department of Chemistry, The University of British Columbia, 2036 Main Mall, Vancouver, B.C., Canada V6T 1Z1.

The diatomic molecules BiN and BiP have been prepared using a laser ablation technique and studied by Fourier transform microwave spectroscopy, in the frequency range 7-22GHz. For BiN only the $J = 1 - 0$ transition fell within this range. Transitions for the ground and first excited vibrational states have been observed for both Bi$^{14}$N and Bi$^{15}$N. For BiP, which has only one isotopomer, the transitions $J' - J'' = 1 - 0, 2 - 1$ and $3 - 2$ have been observed, but only for the ground vibrational state. Hyperfine structure has been observed for all nuclei in both molecules; the $^{209}$Bi nuclear quadrupole coupling constants indicate that the electronic structures are similar for the two molecules. Improved bond lengths have been obtained for both molecules.