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

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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.