HIGH RESOLUTION SPECTROSCOPY OF YTTRIUM MONOBROMIDE

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The first high resolution measurement of the spectrum of YBr has been made by cavity Fourier transform microwave (FTMW) spectroscopy. Laser ablation was used to produce the gas-phase yttrium monobromide samples. Pure rotational transitions of $Y^{79}Br$ and $Y^{81}Br$, in both the ground and first excited vibrational states, have been measured in the frequency range 7.4 to 22.6 GHz. Rotational constants have been determined and the equilibrium bond length has been calculated. Hyperfine structure due to the bromine nuclei has been observed and nuclear quadrupole and nuclear spin-rotation constants have been determined. From these results, the Y-Br bond has been found to be highly ionic and similar in behaviour to the bonds in alkali metal bromide species.