

## ELECTRONIC TRANSITIONS OF YTTRIUM MONOPHOSPHIDE

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Electronic transition spectrum of the yttrium monophosphide (YP) molecule in the visible region between 715 nm and 880 nm has been recorded using laser ablation/reaction free-jet expansion and laser induced fluorescence spectroscopy. The YP molecule was produced by reacting laser - ablated yttrium atoms with PH<sub>3</sub> seeded in argon. Thirteen vibrational bands were analyzed and five electronic transition systems have identified, namely the [12.2]  $\Omega = 3 - X^3\Pi_2$  transition, [13.3]  $\Omega = 3 - X^3\Pi_2$  transition, [13.4]  $\Omega = 3 - X^3\Pi_2$  transition, [13.5]  $\Omega = 3 - X^3\Pi_2$  transition, and [13.4]  $\Omega = 2 - X^3\Pi_2$  transition. Least squares fits of the measured rotational lines yielded molecular constants for the ground and excited states. The ground state symmetry and the bond length  $r_0$  of the YP molecule have been determined to be a  $X^3\Pi_2$  state and 2.4413 Å respectively in this work. A molecular orbital energy level diagram has been used to help the assignment of the observed electronic states. This work represents the first experimental investigation of the spectrum of the YP molecule.