LASER INDUCED FLUORESCENCE SPECTROSCOPY OF COBALT MONOBORIDE

H. F. PANG, Y. W. NG AND A. S-C. CHEUNG , *Department of Chemistry, The University of Hong Kong, Pokfulam Road, Hong Kong..*

Laser induced fluorescence spectrum of cobalt monoboride (CoB) in the visible region between 465 and 560 nm has been observed. CoB molecule was produced by the reaction of laser ablated cobalt atom and diborane (B_2H_6) seeded in argon. Over twenty five vibronic bands have been recorded, and both $Co^{10}B$ and $Co^{11}B$ isotopic species have been observed and analyzed. Preliminary analysis of the rotational lines showed that the observed vibronic bands belong to two categories namely: the $\Omega' = 2$ - $\Omega'' = 2$ and the $\Omega' = 3$ - $\Omega'' = 3$ transitions, which indicated the ground state of CoB is consistent with an assignment of a $^3\Delta_i$ state predicted from ab initio calculations. Unresolved hyperfine structure arising from the Co nucleus (I = 7/2) causes a broadening of spectral lines. This work represents the first experimental investigation of the spectrum of the CoB molecule.

Financial support from the Research Grants Council of the Hong Kong Special Administrative Region, China (Project No. HKU 701008P) is gratefully acknowledged.