NEAR INFRARED LASER SPECTROSCOPY OF SCANDIUM MONOBROMIDE

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High resolution laser spectrum of scandium monobromide (ScBr) between 787 and 845 nm has been investigated using the technique of laser vaporization/reaction with free jet expansion and laser induced fluorescence spectroscopy. ScBr was produced by reacting laser vaporized Sc atoms with ethyl bromide (C_2H_5Br). Spectra of six vibrational bands of both $Sc^{79}Br$ and $Sc^{81}Br$ isotopomers of the $C^1\Sigma^+$ - $X^1\Sigma^+$ transition and seven vibrational bands of the $e^3\Delta$ - $a^3\Delta$ transition were obtained and analyzed. Least-squares fit of the measured line positions for the singlet transitions yielded accurate molecular constants for the v = 0 3 levels of the $C^1\Sigma^+$ state and the v = 0 2 levels of the $X^1\Sigma^+$ state. Similar least-squares fit for the triplet transitions yielded molecular constants for the v = 0 2 levels of both $e^3\Delta$ and $a^3\Delta$ states. The equilibrium bond length, r_0, of the $a^3\Delta$ state has been determined to be 2.4789 $\mathring{A}$.
Financial support from the Research Grants Council of the Hong Kong Special Administrative Region, China (Project No. HKU 701008P) is gratefully acknowledged