IMPROVED DETERMINATION OF THE Na-Ar $X^2\Sigma$ INTERACTION POTENTIAL FROM LASERSPECTROSCOPY

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In a previous laserspectroscopic study of the $A^2\Pi \leftarrow X^2\Sigma$ transition of NaAr five vibrational levels $v = 0 \ldots 4$ of the $X^2\Sigma$ state have been observed[a]. Recently, we have performed an improved high-resolution investigation of this transition yielding experimental information on two more vibrational levels $v = 5$ and 6. 135 absorption lines have been observed starting from $v = 5$ and leading to $v' = 6 \ldots 8$ of $A^2\Pi$. Only a few lines connecting $v = 6$ with $v' = 5 \ldots 7$ could be detected. Therefore the assignment of rotational quantum numbers is very tentative in this case. Our preliminary results for the spectroscopic parameters of these levels are (in units of cm^{-1})

	T_v-T_o	$10^2 B_v$	$10^5 D_v$
$v = 5$	34.22(10)	1.72 (2)	2.3(2)
$v = 6$	35.09(20)	0.52 (4)	—

The $X^2\Sigma$ interaction potential has been determined in form of an analytical HFD function using our standard method of approach[b]. In addition, the spectral distribution of the fluorescence $A \rightarrow X$ has been recorded showing the well-known reflection structure and allowing a determination of the repulsive part of the $X^2\Sigma$ potential.

[a] G. Aepfelbach et al, Chem. Phys. Lett. 96 (1983) p. 311

[b] F. Bokelmann and D. Zimmermann, J. Chem. Phys. 104 (1996) p. 923