LASERSPECTROSCOPY OF THE $B^2\Sigma$ STATE OF LiAr

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The rovibrational structure of the transition $B^2\Sigma \leftarrow X^2\Sigma$ of LiAr has been investigated by means of high-resolution laser spectroscopy using a supersonic beam for production of the molecules [a]. About 100 absorption lines could successfully be assigned for each isotopomer ^{7}LiAr and ^{6}LiAr providing in addition the vibrational numbering of the observed levels $v = 0...3$ of the $B^2\Sigma$ state. The analysis of the experimental observations was complicated by the occurrence of perturbations between rovibrational levels of the $B^2\Sigma$ and of the $A^2\Pi$ state which have not been taken into account, up to now.
For the $B^2\Sigma$ interaction potential we used a Morse–van der Waals potential as an analytical expression reproducing the observed energy levels with an error margin of 0.015cm^{-1}. The van der Waals parameter C_6 was fixed to its theoretical value. Our preliminary results for the $B^2\Sigma$ state of ^{7}LiAr are $R_e = 6.24(5)$ Å and $D_e = 33.8(2.0)\text{cm}^{-1}$.

[a] R. Brühl and D. Zimmermann, Chem.Phys.Lett. 233 (1995) p.455