DOPPLER-FREE STUDY OF THE Li_2 MOLECULE: THE $B^1\Pi_u$ STATE

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We have studied the potential barrier in the $B^1\Pi_u$ state of lithium dimers by use of a Doppler-free spectroscopy experiment in which a cw tunable laser beam crosses an effusive beam of lithium. Under these conditions, hundreds of wavenumbers have been measured to an accuracy of 10^{-3} cm^{-1}. From broadened profiles corresponding to P, Q and R transitions for v'=13, 14, 15 and 16, it is possible to describe the potential barrier of the $B^1\Pi_u$ state, between 50 cm^{-1} and 150 cm^{-1} from its top. These results complement the ones obtained by use of Fourier transform spectroscopy with Doppler-broadened light sources[a]. Theoretical interpretation is on the tracks.

[a] I. Russier, F. Martin, C. Linton, P. Crozet, A. J. Ross, R.Bacis and S. Churassy, J. Mol. Spectroscopy, 168, 39 (1994)