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Excited $1_u(5^1P_1)$ state of Cd_2 and the dipole moment of the $1_u(5^1P_1)$–$X0_g^+$ electronic transition

Teresa GRYCUK, Tomasz KLODA, Monika K. KUBKOWSKA, Tomasz KUTNER

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Abstract

The satellite band of the 228.8 nm Cd line associated with the $1_u(5^1P_1)$–$X0_g^+$ electronic transition in Cd_2 is measured in absorption and used for probing and correcting the excited state potential by means of quantum simulations of the spectrum. Best theoretical potential curves available are employed as the initial input data and the spectrum calculated for a single molecule is compared with the experimental spectrum of the absolute absorption coefficient per atom pair. The method yields considerable correction of the upper state potential which, finally, reproduces the experimental spectrum quite well. The dipole transition moment function is roughly determined.