

ASSIGNMENT OF WATER VAPOR SPECTRUM FROM THE NEAR IR UP TO VISIBLE SPECTRAL REGION

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Water vapor absorption linelist has been constructed in the 9000 – 26000 cm^{-1} spectral region by combining the experimental Fourier Transform spectra presented in Refs. [1-3]. The resulted spectrum has been assigned relying on the high accuracy Partridge and Schwenke (PS) calculations as well as on the recent variational linelist (Ref. [4]). The Expert system for the automatic assignment of the molecular rovibrational spectra [5] was also exploited.

As a result of the spectrum assignment most part of lines left unidentified in Refs. [2-3] were assigned. Detailed analysis performed in this study suggests that part of weak lines reported in Ref. [2], which could not be identified neither in [2] nor in our paper, may represent artifacts accompanying the observation of strong line.

Reasonable agreement between the calculated PS intensities and the observed data was evidenced for the whole spectral region under study, while the PS prediction of the water vapor line positions was found to diverge rapidly for wavenumbers higher than 16000 cm^{-1} . In this last case more accurate variational linelist [4] was used in the assignment. However, the accuracy of the calculated line positions in the shortwave end of the analyzed spectrum was not high enough for unambiguous assignment of certain weak lines in the absence of the ground state combination differences. On this reason part of weak lines in the shortwave end of the spectrum was left unassigned.

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