

Vibrational dependence of potential parameters for H₂O – He system

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The measurements and calculations of line broadening and shift coefficients of water vapor line in the near infrared range have been done. The data on line broadening and shift coefficients for nine vibration bands ν_1 , ν_3 , $2\nu_2$, $\nu_1+\nu_2$, $\nu_2+\nu_3$, $2\nu_1$, $\nu_1+\nu_3$, $2\nu_2+\nu_3$ and $\nu_1+\nu_2+\nu_3$ have been obtained from the analysis of the H₂O–He absorption spectra recorded from 3000 to 9000 cm⁻¹ with help of IFS125 HR Fourier spectrometer at room temperature, spectral resolution of 0.01cm⁻¹ and in wide pressure range of He. Additionally literature data for rotational band [1, 2] and ν_2 band (1850 – 2140 cm⁻¹) [3] have been used. The calculations of line broadening and shift coefficients are made by a semiclassical method with use of potential defined as the sum of pair Lennard-Jones potentials. The vibrational and rotational dependence of the potential parameters as well as the temperature dependence of the calculated lines broadening and shift coefficients have been demonstrated.

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