

Fourier-transform absorption spectroscopy of H_2^{16}O and H_2^{18}O with LED sources between 15 000 and 16 000 cm^{-1}

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The absorption spectra of natural and ^{18}O enriched water vapour samples have been recorded by Fourier-transform spectroscopy. The bright LED sources have been used with Bruker IFS 125M spectrometer for the spectra registration between 15 000 and 16 000 cm^{-1} . The spectra were recorded at room temperature and a spectral resolution of 0.03-0.05 cm^{-1} with optical pass lengths of 1920 and 3480 cm and water vapour pressure of 25-30 mbar. High sensitivity to absorption ($K_{\min} \sim 2 \times 10^{-7} \text{ cm}^{-1}$ in the 15 000 – 15 500 cm^{-1} range and $K_{\min} \sim 5 \times 10^{-8} \text{ cm}^{-1}$ above 15 500 cm^{-1}) has been achieved by use of the LEDs and 60 cm base optimized multipass cell [1].

High signal to noise ratio ($S/N = 2000 \div 10000$) has allowed one to measure more than 2000 H_2^{16}O and H_2^{18}O lines. More than 350 energy levels of the H_2^{18}O molecule of the $4\nu+\delta$ and 5ν polyads have been determined for the first time. In addition about 70 lines of the H_2^{17}O $3\nu_1+\nu_2+\nu_3$ band were firstly assigned.

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