Optics EXPRESS

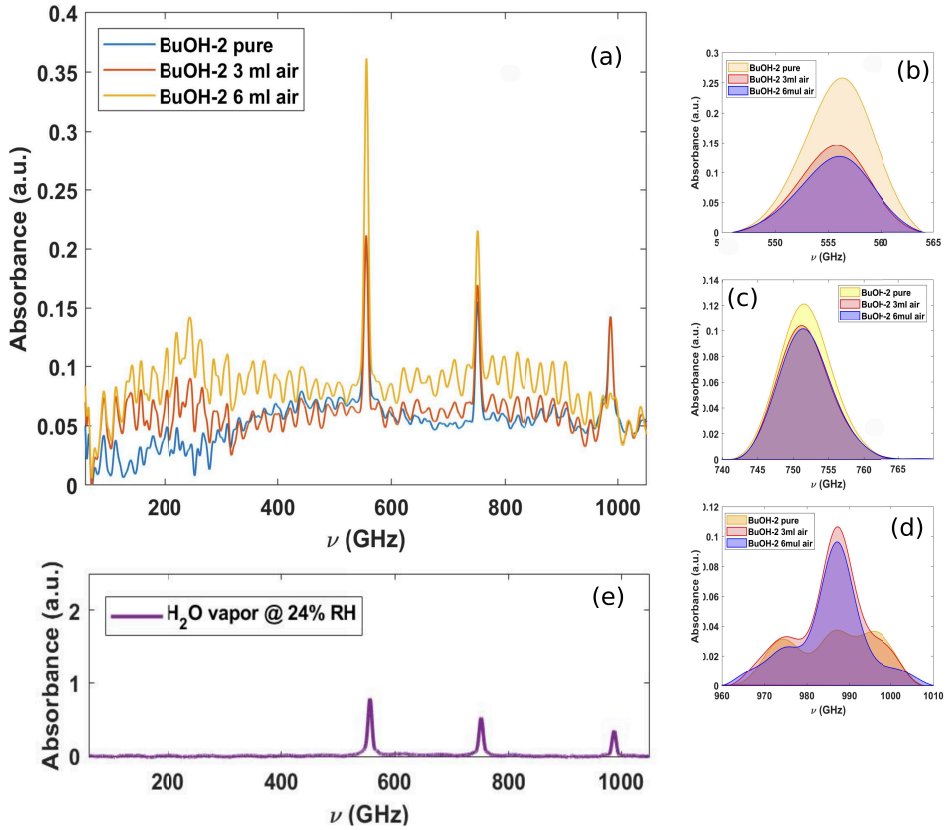

Fig. 4. (a) Experimental absorbances of pure BuOH-2 and BuOH-2/air mixtures. (b), (c) and (d) the integral areas of specific sub-band frequencies at 557 GHz, 751 GHz and 988 GHz, respectively. For the first sub-band frequencies at 557 and 751 GHz a reduction of integrated areas is visible. Observing the sub-band frequency at 988 GHz as the air content grows, a strong spectral modification appears, with the formation of new frequency peaks at around 973.7, 986.9 and 997 GHz. (e) Experimental absorbance of air at 24% RH.

A_{mix}^{exp} is given by

$$A_{mix}^{exp} = A_{BuOH}x_1 + A_{EtOH}x_2 + x_3 \tag{5}$$

where x_1, x_2 are the weights considering the species concentrations in the gas mixture and x_3 a parameter required considering the background, due to any systematic errors associated to the loading gas cells procedures, noise, etalon effect, etc.. Figure 5 illustrates the comparison between the measured absorbance of the binary mixture (blue line) and the absorbance obtained as a weighted linear combination of the measured spectra (dotted red line) for the pure components in the spectral range (60-1000) GHz.

The residual difference reported in Fig. 5(b), shows a good agreement between the experimental mixture absorbance and the weighted linear combination of the pure compounds therefore confirming the validity of the data.