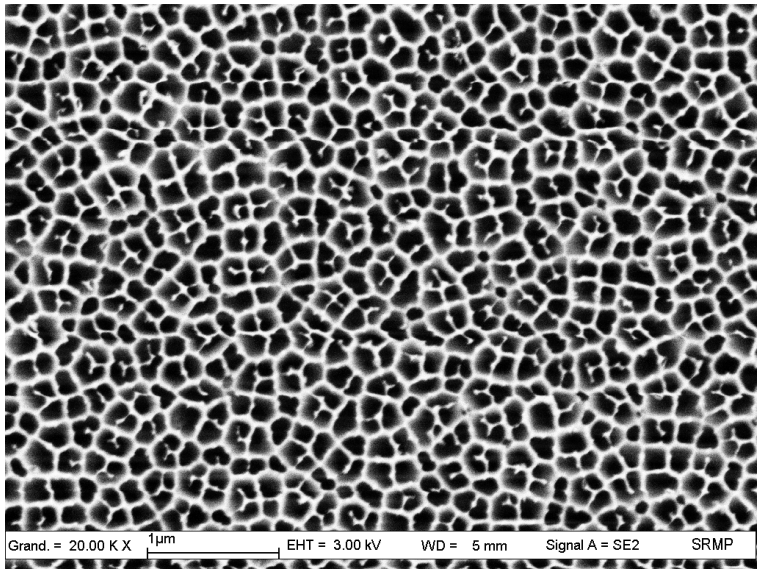
Time-resolved studies of water dynamics and proton transfer at the alumina-air interface
Poster N°12

Sophie Le Caër[1], Jason Palmer[2], Manuela Lima[2], Jean Philippe Renault[1], Georges Vigneron[1], Roberto Righini[2], Stanislas Pommeret[1]

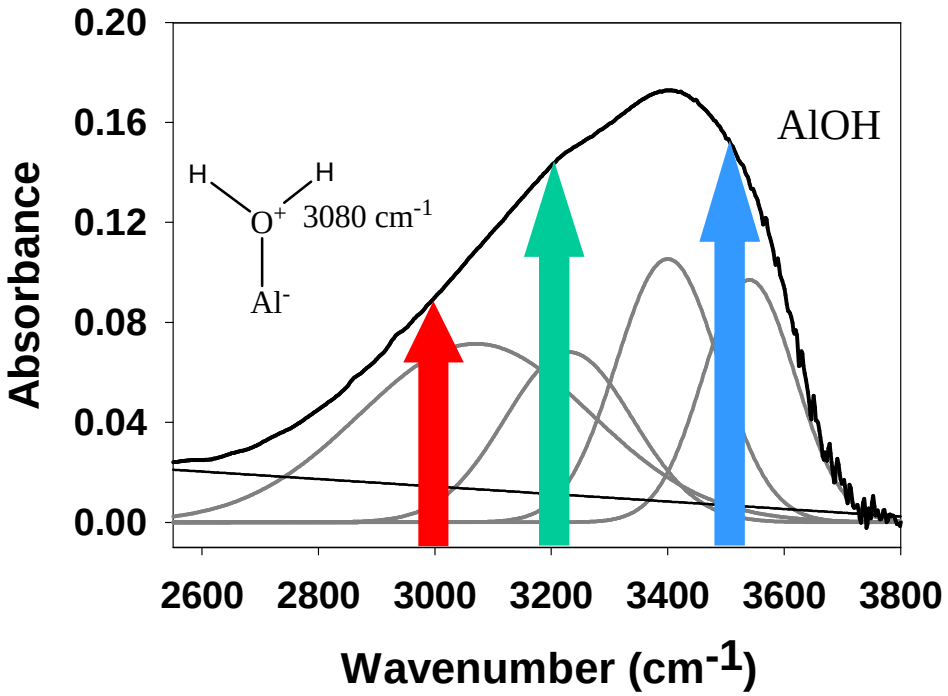
[1]CEA Saclay, DSM/DRECAM/SCM
Laboratoire Claude Fréjacques URA 331 CNRS, France
[2]University of Florence, LENS, Polo scientifico,
Via Nello Carrara 1, I-50019, Sesto Fiorentino, Italy

Nanoporous alumina (Whatman membranes)



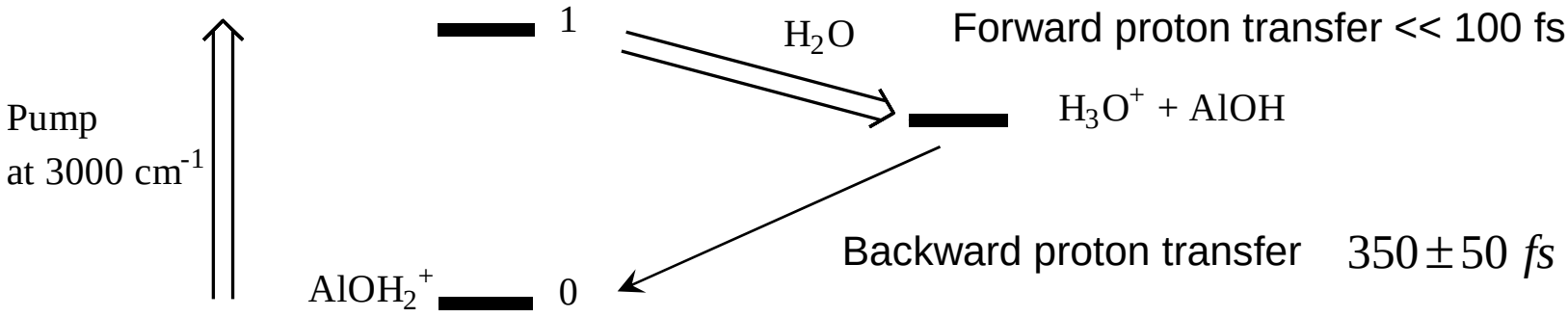
Top view
Pore diameter: 200 nm

FT-IR spectrum in the O-H stretching region



Femtosecond IR-pump IR-probe transient absorption spectroscopy using 3 different pump frequencies: 3000 cm^{-1}; 3200 cm^{-1} and 3500 cm^{-1}

IR induced proton transfer



Reaction scheme

The anisotropy decay is slow and complete. It is attributed to the hopping process of the hydronium cation.

$$H_3O^+ + H_2O \xrightarrow{H-bond\ network} H_2O + H_3O^+$$

$$900 \pm 100\ fs$$