

# Hydration induced structural changes of Polyamide and Polyimide Aerogels

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A detailed inspection of the microstructure of polyamide and polyimide aerogels related to applications in humid environment was carried out and centered on their hydration mechanism. The structures of these porous materials shift remarkably under hydrated conditions. [1-2] The two synthetic aerogels were characterized in the dry state by IR spectroscopy, N<sub>2</sub> adsorption-desorption porosimetry and scanning electron microscopy (SEM). As an indirect approach to study the hydration induced structural changes, the aerogels were hydrated stepwise, and investigated by liquid-state nuclear magnetic resonance (NMR) relaxometry. From the relaxometry measurements we can get information on the different structural regions in association with bound water, and therefore, on the hydration mechanism of the aerogels (Figure 1).

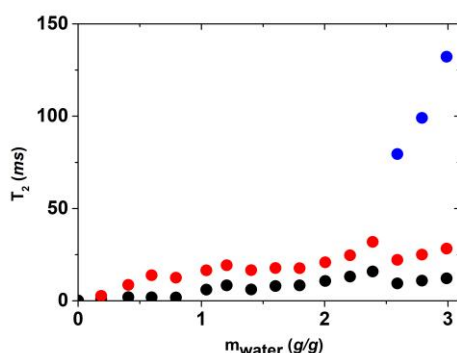


Figure 1:  $T_2$  relaxation times of water as function of water content of hydrated polyamide aerogel.

## References:

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2. Forgács, A., Papp, V., Paul, G., Marchese, L., Len, A., Dudás, Z., Fábíán, I., Gurikov, P. and Kalmár, J., 2021. *ACS Applied Materials & Interfaces*, 13(2), pp. 2997-3010.