

WEBINAR SERIES ON

## NMR RELAXOMETRY THEORY AND APPLICATIONS

WEDNESDAY  
25TH  
NOVEMBER  
2020  
16.00-17.00 CET



DR.  
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**Ionic interactions at  
the liquid-solid interface  
in ionogels studied  
by FFC NMR**

### Abstract

#### **Ionic interactions at the liquid-solid Interface in ionogels studied by FFC NMR**

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"Clean energy" referred to methods and materials which can be used to obtain, transport, and transform electric energy is one of the most investigated research fields in recent years. From new materials, we demand not only high performance but also a low impact on natural habitat. The ionogels are one example of solidification methods for electrolytes, which allows us to obtain a functional material with the potential to use in a wide range of electrochemical applications. Its functionality arises from the fact that used low molecular weight gelators to create the gel phase allows thermally reversible solidification of electrolytes. Our investigations [1, 2, 3] found that such materials based on the monosaccharide derivatives display superior ionic conductivity. To understand and predict these systems' properties, it is crucial to know the interactions and dynamics on the molecular level between the solid gelator matrix and the electrolyte solution. We have used the FFC NMR and PFG NMR diffusometry and optical spectroscopy methods to explain the observed aggregation enhanced ionic conductivity effect (AEIC).

[1] M. Bielejewski, A. Puzkarska, J. Tritt-Goc *Electrochim. Acta* 165 (2015) 122

[2] M. Bielejewski, A. Łapiński, O. Demchuk *J. Coll. Interf. Sci* 490 (2017) 279

[3] M. Bielejewski, A. Rachocki, J. Kaszyńska, J. Tritt-Goc *Phys. Chem. Chem. Phys.* 20 (2018) 5803

### Author Biography

Michal Bielejewski is an assistant professor of physics at the Institute of Molecular Physics Polish Academy of Sciences in Poznan.

His main research interests deal with investigations of new renewable materials for proton and ionic conductors investigated by different NMR methods combined with optical spectroscopy, thermal analysis, and conductometry. During his post dock, he was involved in works on electrophoretic NMR apparatus designed and manufactured by P&L Scientific I.S. in Sweden.