

DF 12: Electrical and mechanical properties

Time: Wednesday 11:30–11:50

Location: GER 37

DF 12.1 Wed 11:30 GER 37

Dielectric spectroscopy on MFU-type metal-organic frameworks — ●PIT SIPPEL¹, DMYTRO DENYSENKO², PETER LUNKENHEIMER¹, DIRK VOLKMER², and ALOIS LOIDL¹ — ¹Center for Electronic Correlations and Magnetism, University of Augsburg, Germany — ²Solid State and Material Science, Institute of Physics, University of Augsburg, Germany

Metal-organic frameworks (MOFs) have a broad range of potential applications, e.g., gas storage, electronic devices and clean-energy technologies [1]. This class of coordination polymers with a crystalline periodic structure consists of metal-containing units with organic linkers, leading to permanent porosity. Here we present dielectric spectroscopy data on several MOFs, namely, MFU-2, MFU-3, MFU-4 and

Co-substituted MFU-4 [2]. The dielectric measurements of MFU-4 reveal interesting relaxational dynamics of the solvent dimethylformamide, confined in the pores of the host system. Moreover, we find a significant change of the electrical conductivity when replacing Zn by Co due to a modification of the band gap [3]. In MFU-2 and MFU-3, by a variation of the organic linkers a dipolar moment is generated. Its dynamics is monitored by dielectric spectroscopy. The results could be of relevance for the application of MOFs in gas separators, gas storage and even information storage devices.

[1] H. Furukawa *et al.*, *Science* **341**, 1230444 (2013).

[2] D. Denysenko *et al.*, *Chem Commun.* **48**, 1236 (2012).

[3] P. Sippel, D. Denysenko, A. Loidl, P. Lunkenheimer, G. Sastre, and D. Volkmer, unpublished.