Nanostructured electrolyte-electrode systems in next-generation batteries

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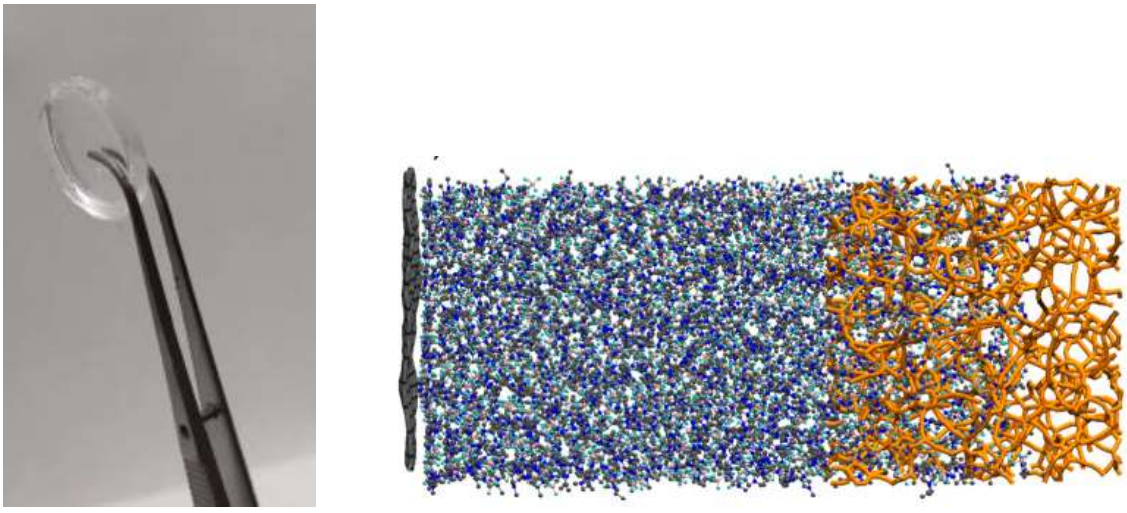
Abstract

In this talk we review the main recent advances in the nanostructured design of electrodes and electrolytes to achieve high efficiencies in electrochemical energy storage devices, specifically alkali metal batteries, redox flow batteries, and supercapacitors. The main strategies currently used to produce smartly engineered nanostructured anodes and cathodes, as well as nanoconfined ionic electrolytes (ionogels) will be treated, together with their main physicochemical properties and the essentials of the structure of the corresponding electrolyte-electrode interface.

REFERENCES

[1] X.-X. Zeng Y.-T.Xu Y.-X. Yin X.-W. Wu J.Yue Y.-G. Guo Materials Today Nano 8 (2019) 100057.
[2] J. M. Otero-Mato, A. Rivera-Pousa, H. Montes-Campos, O. Cabeza, A. Heuer, D. Diddens, L. M. Varela J. Mol. Liq. 333 (2021) 115883.
[3] H. Montes Campos, T. Méndez-Morales, José M. Otero-Mato, O. Cabeza, J. Gallego, E. Lomba, L. M. Varela J. Mol. Liq. 318 (2020) 114264-1-12.
[4] Jisung Lee, Jinuk Kim, Seongseop Kim, Changshin Jo and Jinwoo Lee Mater. Adv 1 (2020) 3143—3166.

FIGURES



a (b)

Figure 1: Nanoconfined electrolytes: (a) Si-based ionogel (IL:[TMOS:DMDMS]:FA); (b) Ionic liquid inside a zeolite template.