universität ulm

Physikalisches Kolloquium — Physics Colloquium

Einladung — **Invitation**

Monday, 05 June 2023

Lecture Hall N24/H13, at 16:15
Coffee and cookies will be served in front of the lecture hall from 16:00

Well-defined nanostructures for electrochemical energy storage and conversion devices

Prof. Yong Lei

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Template-based technique provides a perfect approach to realize well-defined arrayed nanostructures within large-scale. We have developed nanostructuring techniques mainly using anodic aluminum oxide templates with scalable, parallel and fast processes [1-4] for fabricating different three-dimensional and surface nanostructures. The obtained well-defined nanostructures possess large-scale arrayed configuration, high structural density, perfect regularity and cost-effectiveness, and are highly desirable for constructing different nano-devices especially for energy storage and conversion applications, including rechargeable sodium-ion and potassium-ion batteries [5-10], supercapacitors [11-13], and photo electrochemical devices[14-16]. The device performances demonstrated that the obtained nanostructures benefit these applications through the precise control over the structural features enabled by the geometrical characteristics of the templates. These achievements indicate the high potential and importance of template-based nanostructuring techniques for both basic research and device applications.

Refs:

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(9) Y. Xu, Y. Lei et al., ***Angew. Chem. Int. Ed.*** **2015**, *54*, 8768.
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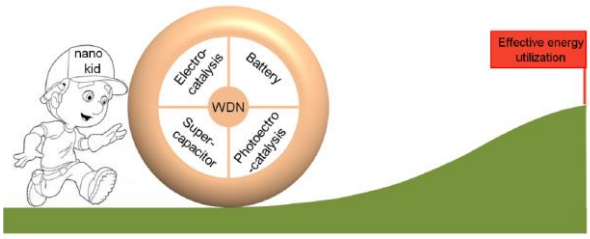
(11) Z. Lei, H. Zhao, F. Liang, Y. Lei, et al., ***Nat. Commun.*** **2020**, **11** (1), 299.
(12) H. Zhao, Y. Lei, et al., ***Adv. Mater.*** **2014**, *26*, 7654.
(13) F. Grote, Y. Lei, ***Nano Energy***, **2014**, *10*, 63.
(14) L. Wen, Y. Lei, ***Nano Letters*** **2018**, *18*, 4914.
(15) R. Xu, Y. Lei et al., ***ACS Nano*** **2017**, *11*, 7382.
(16) Z. Wang, Y. Lei et al., ***Nat. Commun.*** **2016**, *7*, 10348.



Xu R, Lei Y* et al, 'Well-defined nanostructures for electrochemical energy conversion and storage', *Advanced Energy Materials*, 2001537, 2021 (**10th Anniversary Article**).

Host: Prof. Dr. Ute Kaiser, Electron Microscopy Group of Materials Science

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