Advanced probing technology in LIBs Interface Research

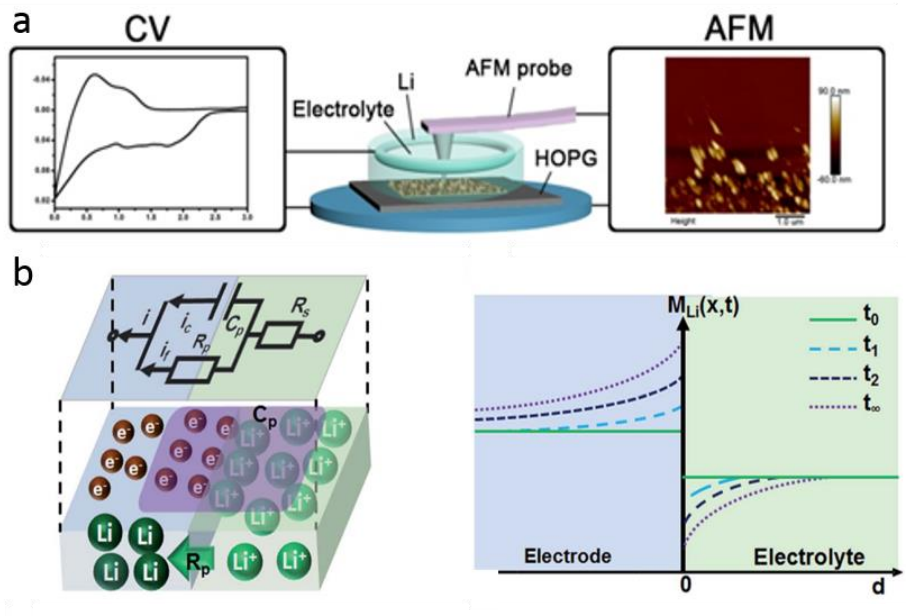
Kai Yang, Wenju Ren and Feng Pan

School of Advanced Materials, Peking University Shenzhen Graduate School, Shenzhen,China

E-mail: 1601213904@sz.pku.edu.cn

Herein, interface research in LIBs were investigated using two advanced probing technologies (in-situ AFM and LGPM). Firstly, the effect of two sulfur-containing additives is investigated by in-situ AFM (shown in Scheme. 1a).[1] The in-situ AFM observation provides us a vivid image of how the SEI layer gradually formed on the fresh surface of the graphite anode in an LIB during the initial cycle.

Secondly, we demonstrated that the state of health and state of charge of LFP/C batteries can be probed in-situ using a large galvanostatic pulse method (LGPM) in combination with a simple first-order RC equivalent circuit (shown in Scheme. 1b).[2] The method developed in this work can be integrated in electric vehicles at a low cost. More importantly, we gained a better understanding of the interfacial kinetics of Li-ions during a non-equilibrium process



Scheme 1. Schematic illustrations for (a) in situ AFM; (b) LGPM method.

References:

1. Lin, L.; Yang, K.; Tan, R.; Li, M.; Fu, S.; Liu, T.; Chen, H.; Pan, F., Effect of sulfur-containing additives on the formation of a solid-electrolyte interphase evaluated by in situ AFM and ex situ characterizations. *Journal of Materials Chemistry A* **2017,** *5* (36), 19364-19370.

2. Ren, W.; Chen, H.; Qiao, R.; Lin, Y.; Pan, F. *Journal of Materials Chemistry A* **2017,** *5* (43), 22598-22606.