Prussian Blue@MoS_2 Layer Composites as Highly Efficient Cathodes for Sodium- and Potassium-Ion Batteries

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The mixed-valence compound known as Prussian blue (PB) has attracted widespread interest because of its promising applications as cathode material for sodium-ion batteries (SIBs).[1] However, the presence of structural defects and occluded water molecules in this compound can detrimentally affect the electronic conductivity, capacity and stability of the material. In this respect, PB@graphene cathode composites have shown high-rate performance and even better cyclability than the bare PB.[2] Notwithstanding, PB based composites with other 2D materials apart from graphene are almost unexplored. Indeed, the potential synergistic combination of two high-performance energy storage materials like PB and exfoliated molybdenum disulphide (MoS2) into a new composite is still a nascent field of research. In the present work, we will talk about the active role of charged MoS_2 flakes on the PB@MoS_2 composite formation (Fig. 1) and the electrochemical measurements (Fig. 2) that prove the applicability of this new composite as cathode material for sodium- and potassium-ion batteries (SIBs and KIBs, respectively).

References

[1] Y. You, X.-L. Wu, Y.-X. Yian, Y.-G. Guo *Energy Environ. Sci.* **2014**, *7*, 1643-1647.

[2] S. J. R. Prabakar, J. Jeong, M. Pyo, *RSC Adv.* **2015**, *5*, 37545-37552

Figures

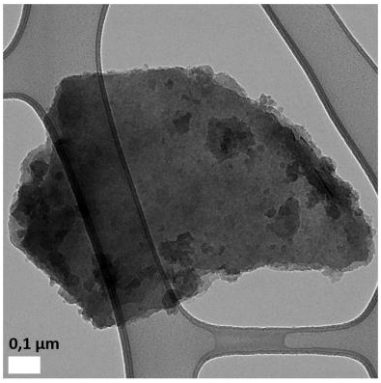

Figure 1: TEM image of the PB@MoS_2 composite.

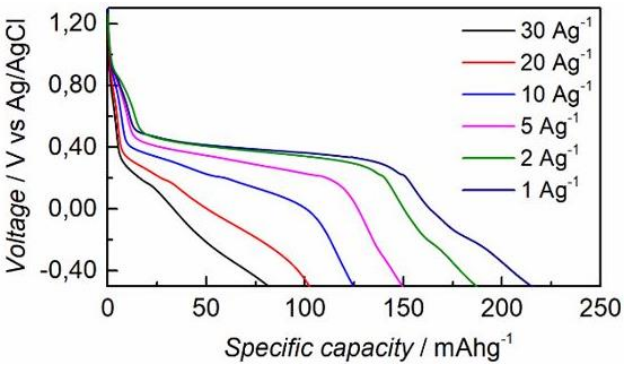

Figure 2: Galvanostatic discharge curves at different current densities.