Energy conversion and storage devices based on solution processed 2d crystals

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Abstract

Energy conversion and storage are two of the grand challenges that our society is currently facing. New materials and processes[1] can improve the performance of existing devices or enable new ones[1-5] that are also environmentally friendly. In this context, graphene and other two-dimensional (2d) crystals are emerging as promising materials.[1-5] A key requirement for energy conversion and storage applications is the development of industrial-scale, reliable, inexpensive production processes,[2] while providing a balance between ease of fabrication and final material quality with on-demand properties.[2]

Solution-processing[2,6] is offering a simple and cost-effective pathway to fabricate various 2d crystal-based energy devices, presenting huge integration flexibility compared to conventional methods. Here I will present an overview of graphene and other 2d crystals-based energy conversion and storage applications, starting from solution processing of the raw bulk materials,[2,7,8] the fabrication of large area electrodes[3] and their integration in lithium-ion batteries[8,9] and photovoltaic devices.[10]

References

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