The science and technology of graphene and inorganic 2D crystals

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New materials and processes[1] can improve the performance of existing devices or enable new ones,[1-5] with the added values with respect to the current technology to be environmentally benign. In this context, graphene and other inorganic 2D crystals are emerging as promising materials,[1-5] with the opportunity to enable new products/devices.[1] However, a fundamental requirement for the application of 2D crystals in areas such as flexible electronics and energy storage and conversion relies on the development of industrially scalable, reliable, inexpensive production processes.[2] Moreover, the synthesis strategies should provide a balance between ease of fabrication and final material quality with on-demand properties.

Solution-processing[2,6] offers a simple and cost-effective pathway to fabricate various 2D crystal-based (opto)electronic and energy devices, presenting huge integration flexibility compared to conventional methods. Here, I will present an overview of graphene and other 2D crystals for flexible and printed (opto)electronic and energy applications, starting from solution processing of the raw bulk materials,[2] the fabrication of large area electrodes[3] and their integration in the final devices.[7-15]

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