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Soft Chemical Synthesis of H_xCrS_2: An Antiferromagnetic Material with Alternating Amorphous and Crystalline Layers (Seed 9)

Xiaoyu Song,† Guangming Cheng,‡ Daniel Weber,¶ Florian Pielnhofer,§ Shiming Lei,† Sebastian Klemenz,† Yao-Wen Yeh,‡ Kai A. Filsinger,‖ Craig B. **Arnold**,‖ Nan **Yao**,‡ and Leslie M. **Schoop**[*,†]

† Department of Chemistry, Princeton University USA
‡ Princeton Institute for Science and Technology of Materials, Princeton University USA
¶ Department of Chemistry, Ohio State University USA
§ Institute of Inorganic Chemistry, University of Regensburg, Germany
‖ Department of Mechanical and Aerospace Engineering, Princeton University USA

2D materials that have thickness of only one structural unit have shown their potential for application in next generation device technology, new catalysts and energy storage. In this work, by applying a soft chemical synthesis method to a layered compound $NaCrS_2$, the team successfully synthesized a new layered compound H_xCrS_2. They found the new compound naturally builds a heterostructure composed of ordered and disordered lamellae, as revealed by an ultra-high-resolution microscopy (Fig.1-left). Such a unique structure is promising for energy storage applications. In addition, they were able to exfoliate the materials and introduced a new air-stable, potentially magnetic, chromium-sulfide-based 2D material (Fig. 1-right), which will be of interest for the next generation's memory devices.

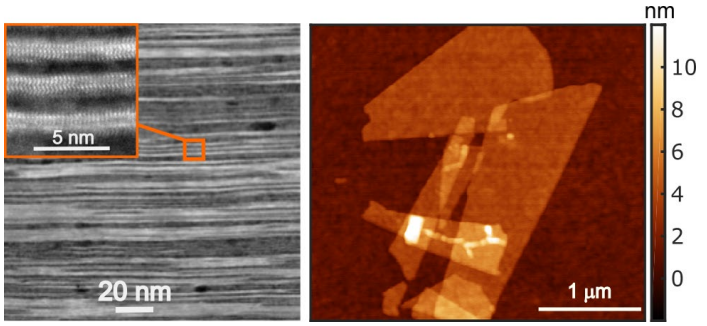

Fig. 1. (Left) An image showing the cross-section layered structure of H_xCrS_2. (Right) An image of the exfoliated nanosheets with a thickness of 2-3 nm.

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