

Special Issue on
**Engineered 2D Materials: Future Material for
Nanoelectronics, Energy, and Catalysis Applications**

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Two-dimensional (2D) materials, such as graphene, silicene, and MoS₂, have been at the forefront of material research in recent years due to their interesting electrical, optical and mechanical properties. 2D materials are single or few-layered crystalline materials with thicknesses of a few nanometers or atomically thin. The properties of these materials can also be easily manipulated through surface functionalization using suitable guest molecules, and this functionalization is possible due to their comparatively huge exposed surface area. The extraordinary physical properties and the possibilities for tuning the properties of these materials through surface functionalization or composite formation make 2D materials suitable for many applications such as catalysis, photovoltaics, semiconductors, electrodes and water purification.

Facile synthesis of a range of ultra-thin two-dimensional materials and easy surface functionalization to create and/or to tune a specific property of these materials through various routes (physical or chemical) opens up the possibilities of making a range of engineered nanomaterials with unique properties for specific applications.

The synthesis of 2D materials and their composites, and the potential for a wide range of potential applications of these materials has already been proven. However, the research related to 2D materials is still in its initial stage. Concentrated effort is needed to find out easy and efficient synthesis methods for the development of new kinds of 2D materials and composites with superior properties for practical real-world applications. The optimization of the process parameter is also an important research focus.

This Special Issue aims to focus on the recent advances in methods of material synthesis, material characterization, design, and applications of new 2D materials and composites in nanoelectronics, energy and catalysis. It welcomes high-quality research papers on these topics, showing both technical advances and practical utilizations. Review articles which describe the current state of research on the synthesis of 2D materials, or their composites, and possible applications are also welcome.

Potential topics include but are not limited to the following:

- ▶ Design, synthesis and characterization of novel 2D materials and/or composites
- ▶ Controllable growth of 2D materials and new fabrication techniques for use in devices
- ▶ Large/bulk scale synthesis of 2D materials
- ▶ 2D materials-based memory devices, FET or Chem-FET devices, and other electronic devices
- ▶ Development of electrodes/photo-electrodes for energy applications and photovoltaic devices
- ▶ Catalytic function related to 2D materials and their composites
- ▶ Theoretical studies on 2D materials and/or their applications

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/jchem/materials.chemistry/fene/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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