

Cluster-based Materials: From Fundamentals to Application

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Clusters of metals and semiconductors are promising building blocks for functional materials because they exhibit size-specific physicochemical properties due to unique atomic packing, morphology, and quantized electronic structures. Moreover, new collective properties emerge when they are assembled into well-defined structures. However, it is challenging to synthesize these clusters with atomic precision and assemble/connect them into desired structures. In this symposium, we will discuss the state of the art and perspectives of different types of cluster-based materials. Specifically, we will discuss the developments in the synthesis of each type of cluster, their unique optical and catalytic properties, the means to use them as building blocks of materials, and their applications in a variety of fields.