Editorial

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Editorial Note on MXenes

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Editorial Note

Two-dimensional (2D) materials have been studied extensively for the past 15 years, beginning with the discovery of the remarkable physical features of single-layer graphene. This sparked a new surge of study into well-known 2D materials including metal dichalcogenides and boron nitride, as well as the discovery of a slew of new 2D materials. While many of these materials remain strictly academic, others have risen to prominence as a result of their appealing features, which have led to practical uses. MXenes (pronounced "maxenes"), a rapidly expanding family of 2D materials, are carbides and nitrides of transition metals.

n + 1 (n=1–3) layers of early transition metals with a general formula of $M_{n+1}X_nT_x$ are found in a 2D flake of MXene. The surface terminations, such as O, OH, F, and/or Cl that are bonded to the outer M layers are represented by Tx in the formula. MXenes come in a wide range of compositions and topologies, resulting in a huge and constantly growing family of 2D materials. MXenes their precursor MAX phases, and intercalated metal ions in MXenes are examples of fundamental chemical concepts, demonstrating how the elements can be utilized as building blocks to create a wide range of nanomaterials.

The United Nations General Assembly and the United Nations Educational, Scientific, and Cultural Organization have declared 2019 the International Year of the Periodic table of Chemical Elements to commemorate the 150th anniversary of Dmitri Mendeleev's now-iconic periodic table of the elements. The MAX and MXene compositions are excellent examples of the periodic table's power.