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Controlled growth of ultranarrow inorganic nanowires on 2D materials functionalized with noncovalent template layers

A novel, scalable templating technology allows for the fabrication of inorganic architectures by converting molecular features into transferable metallic features, enabling the stacking of 2D layers into 3D structures for advanced nanowire development.

In the past, nanometer-think 2D layers have not been able to be stacked into 3D architectures. They use monolayers to modify surfaces to control deposition of additional material layers, but this is inefficient. This current process limits the scalability at the scale that they want to achieve, limiting their ability to fabricate inorganic architectures at the same scale. There is a clear need for a new technology that will scale this fabrication at a level that they want to achieve.

Researchers at Purdue University have developed a new technology that allows surfaces to be template with molecular features that can be converted into metallic features with similar size. Also, the template is noncovalently bound to the substrate. This may allow for the transferring of the template after features are developed. This could mean that nm-thick 2D layers could be able to be stacked into 3D architectures. This could allow for this technology to be more scalable than the current one, opening the door for how nanowires are developed and manufactured.

Advantages:

-Converted to metallic features

-Noncovalently

-Scalable

Potential Applications:

-Headgroup synthesis

Technology ID

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Category

Semiconductors/Fabrication & Process Technologies
Materials Science & Nanotechnology/Nanomaterials & Nanostructures

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-2D materials

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