Carbon Nanomembranes (CNM) : 2D Materials Beyond Graphene

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Carbon Nanomembranes (CNMs) are extremely thin (~1nm), synthetic two-dimensional (2D) layers or sheets with tailored physical, chemical or biological function [1]. Their fabrication scheme utilizes a sequence of molecular monolayer assembly on a solid surface and radiation induced cross-linking in two dimensions. The cross-linked monolayer is then released from the surface, forming a self-supporting nanomembrane with properties that are determined by properties of the monolayer. Depending on the desired applications, CNMs can be engineered with a controlled thickness, elasticity and surface functionalization. Helium ion microscopy, spectroscopic methods and functional tests are applied to investigate the structure and composition as well as permeation properties. Helium Ion Lithography is used the fabrication of well-defined nanopores [2] and perforated CNMs are tested as ballistic membranes for the separation of gases and liquids.

References

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