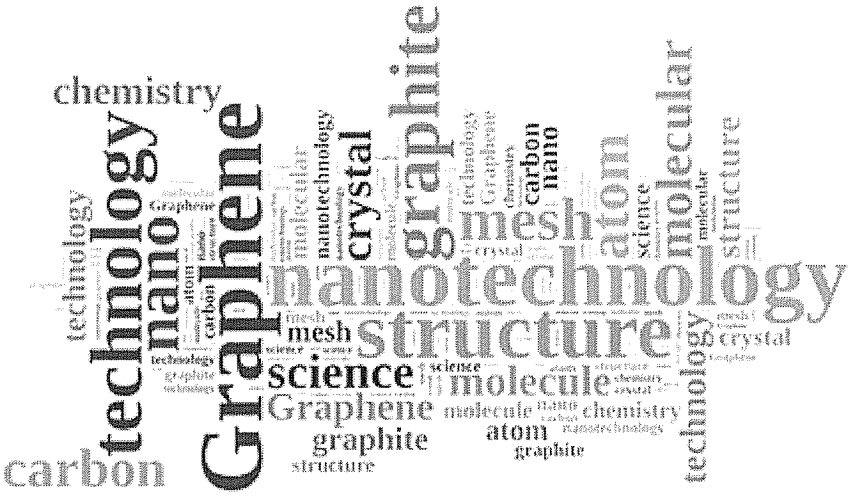
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**A close up look at ultra-thin nanomaterials for industrial use**

(*Nanowerk News*) Advances in nanomaterials hold the promise of new, better, more competitive products. The EU-funded 2DInterFOX project is seeking new insights into their behaviour - the results could help manufacturers develop new electronic and energy-related products, potentially boosting their competitiveness.




While the potential of nanomaterials and nanotechnologies is well documented, translating the science of the very small into commercial success has been a difficult process. Two-dimensional (2D) nanomaterials consist of ultra-thin layers, which may be as thin as a single atom. The ultra-thin nature of 2D nanomaterials gives them special properties, such as high surface-to-volume ratios and exceptional thermal and electronic properties. This has heralded applications in modern electronics and energy storage and harvesting. Unlike traditional bulk materials, there are more atoms on the surface of a 2D material than in the middle of it. Surface atoms act differently to atoms inside a material, so when there are more surface atoms than inside atoms, the way they behave affects how a material behaves. Much is however still unknown about 2D materials at the atomic level, and in particular about the interaction of 2D materials with other nanomaterials. 2DInterFOX will attempt to provide answers on the interactions between 2D nanomaterials and non-2D metal-oxide materials, which are used in electronics and energy-related industries. This information could help industry scale up the integration of 2D nanomaterials with other types of nanostructures. Such a breakthrough could be used for applications in flexible, transparent, low-cost electronics or for the energy sector. 2DInterFOX proposes to employ scanning transmission electron microscopy (STEM) techniques, whereby a beam of electrons is transmitted through an ultra-thin sample, to create an image of the sample's structure at the atomic level and find out more about the chemical and electronic interactions of the 2D materials with metal-oxide nanostructures.

Read more: A close up look at ultra-thin nanomaterials for industrial use