Molecules, surfaces and symmetry: from geometry to nanoscience.

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Supramolecular networks are attracting considerable interest as highly ordered functional materials for applications in nanotechnology and organic electronic devices. The challenge consists in directing the ordering of predesigned molecular species into periodic architectures over extended length scale with atomic precision. The self-assembly of functionalized organic molecules on surfaces is governed by an intricate balance of adsorbate-substrate and adsorbate-adsorbate interactions. The ability to disentangle these competing interactions would enable to design target 2D patterns having the desired properties. Highly-organized supramolecular 2D arrays can be obtained by self-assembly of molecules which interlock via either chemical (such as H-bonds) or physical interactions. An alternative approach aimed at tailoring multicomponent 2D networks consists in trapping guest molecules into a host open network to form guest-host architectures. We report here on some recent 2D mono- or multicomponent self-organized arrays that we generated at the liquid/solid interface and investigated by scanning tunnelling microscopy and their potential implications in nanoscience.[1-5]

References

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