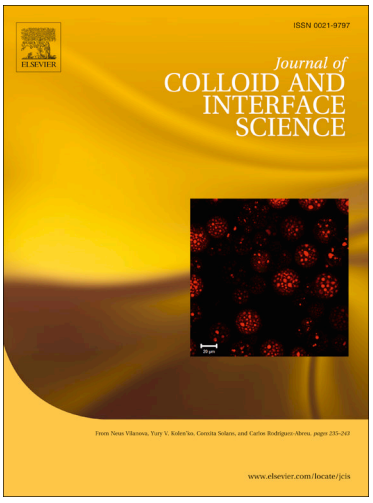

Fabrication of Two-dimensional (2D) Ordered Microsphere Aligned by Supramolecular Self-Assembly of Formyl-Azobenzene and Dipeptide

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Fabrication of Two-dimensional (2D) Ordered Microsphere Aligned by Supramolecular Self-Assembly of Formyl-Azobenzene and Dipeptide

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An azobenzene with a terminal formyl group, named as (4-[(3-Formyl-4-hydroxy)phenylazo]benzene (FHPAB)), was synthesized and used to manipulate the self-assembly of diphenylalanine (FF) molecules. Two-dimensional (2D) thin slices which are composed of ordered microspheres have been constructed through supramolecular self-assembly of FF and FHPAB. The FTIR and XPS results indicate that C=N covalent bond between FF and FHPAB was generated. Hydrogen bonding and strong π–π interaction between the planar FF-HFPAB conjugates are the driving force to form the FF-HFPAB 2D thin slices. Based on the results, a possible formation mechanism of the 2D thin slices was proposed. We also found that the FF-based 2D thin slices possess superhydrophobic properties, which is therefore an extension of the range of applications of peptide assembly.

Keywords: two-dimensional pattern, supramolecular self-assembly, formyl-azobenzene, superhydrophobicity

Materials with two-dimensional (2D) structured patterns and arrays have unique physical and chemical properties.[1] Their high aspect ratio, which comes from their large surface area and ultrathin thickness, makes them excellent candidates for applications ranging from optoelectronic devices, solar cells to chemical and biological sensors.[2] A large number of microfabrication techniques including nanosphere lithography, atomic layer deposition and inkjet printing have been developed to fabricate 2D structured patterns and arrays.[3] Despite their versatile design and precise control in fabricating 2D materials, these