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# ABSTRACT

## Toward Conformational Identification of Molecules in 2D and 3D Self-Assemblies on Surfaces

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The design of supramolecular networks based on organic molecules deposited on surfaces is highly attractive for various applications. One of the remaining challenges is the expansion of monolayers to well-ordered multilayers to enhance the functionality and complexity of self-assemblies. In this study, we present an assessment of molecular conformation from 2D to 3D supramolecular networks adsorbed onto an HOPG surface under ambient conditions utilizing a combination of scanning probe microscopies and atomic force microscopy- infrared (AFM-IR). We have observed that the infrared (IR) spectra of the designed molecules vary from layer to layer due to the modifications in the dihedral angle between the C=O group and the neighboring phenyl ring, especially in the case of a 3D supramolecular network consisting of multiple layers of molecules [1]. We push also the boundaries of AFM-IR spatial resolution to the single-nanometer scale, achieving chemical mapping of supramolecular networks at the submolecular level for the 2D assembly.

[1] A. Hamadeh, F. Palmino, J. Mathurin, A. Deniset-Besseau, L. Grosnit, V. Luzet, J. Jeannoutot, A. Dazzi, F. Chérioux, F. Communications Chemistry, 6, 246 (2023)