Amino-acids functionalization of graphene oxide to achieve controlled adsorption of organic molecules in sensors and water filters

Vincenzo Palermo
Sara Khaliha,[2] Angela Pintus,[2] Sebastiano Mantovani,[2] Tainah D. Marforio,[4] Francesca Tunioli, Alessandro Kovtun, Laura Favaretto, Maria Luisa Navacchia, Matteo Calvaresi,[4] Manuela Melucci,[2,] Chiara Zanardi[2,6,*]*
[1]Ca' Foscari University of Venice, Venezia-Mestre, Italy
[2]Institute for Organic Synthesis and Photoreactivity, National Research Council (ISOF-CNR), via P. Gobetti 101, 40129 Bologna, Italy
[4]Department of Chemistry 'G. Ciamician', Alma Mater Studiorum University of Bologna, via Selmi 2, 40126 Bologna, Italy
[5]Department of Industrial and Materials Science, Chalmers University of Technology, Gothenburg S-41296, Sweden
Vincenzo.palermo@isof.cnr.it

New, dangerous emerging contaminants like pesticides, antibiotics, or fluorinated molecules have been detected in our water, defying current purification techniques and worsening the problems of water scarcity in Europe as well as in other continents.
Graphene oxide (GO) nanosheets are a robust, versatile and cheap nanotechnological platform that can be tailored to remove specific molecules. GO can be included at low cost and large scale in conventional water filters.
Here, we present a summary of diverse recent publications where we functionalize GO with different molecules, in particular amino-acids, to enhance its interaction with specific contaminants like perfluoroalkyl substances (PFAS), glyphosate or antibiotics.
The nano-composites are studied using absorption experiments, spectroscopic characterization and molecular simulations. The good interactions can also be used to sense such molecules using amperometric sensing.
Thanks to such tailored interaction, we demonstrate that these GO-based composites can remove the target contaminants with high efficiency.

References

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