Trends in Nanomaterials-Enriched Chiral Sensors

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Chirality is a prominent characteristic of natural systems [1,2]. It is an impressive characteristic of asymmetric structures, allowing to explain two non-superimposable mirror-image forms, *enantiomers*, of a structure. Investigation of these asymmetric structures is crucial to understand processes occurring in living organisms that act commonly in an enantioselective manner [1,3]. Enantiomers of chiral species in pharmaceuticals or food additives can display different effects on living organisms [4]. Therefore, new effective methods and/or (nano)materials are required to explain the chiral recognition of chiral substances. Chirality has also been considered to be a crucial topic in nanotechnology and inherently chiral or chiral-modified stereospecific nanoparticles have been mostly used in the field of chiral sensors. Metallic nanoparticles, carbon nanotubes, organic and inorganic quantum dots, graphene and related materials, metal-organic frameworks (MOFs), and so forth are employed as innovative chiral sensors. With the recent advances in nanomaterials, great effort has been devoted to the development of miniaturized analytical platforms such as paper-based optical sensing platforms [5]. Taking advantage of the nanomaterials, in this talk, trends in nanomaterials-enriched chiral sensors/platforms that can be used as convenient signal probes to discriminate enantiomers of chiral molecules are overviewed.

References

[1] Wattanakit, C., Côme, Y.B. Saint, Lapeyre, V., Bopp, P., Heim, M., Yadnum, S., Nokbin, S., Warakulwit, C., Limtrakul, J., Kuhn, A., Nat. Commun., 5 (2014) 3325
[2] Zor, E., Morales-Narvaez, E., Alpaydin, S., Bingol, H., Ersoz, M., Merkoçi, A., Biosens. Bioelectron. 87, (2017) 410–416
[3] Torsi, L., Farinola, G.M., Marinelli, F., Tanese, M.C., Omar, O.H., Valli, L., Babudri, F., Palmisano, F., Zambonin, P.G., Naso, F., Nat. Mater., 7 (2008) 412
[4] Zor, E., Bingol, H., Ersoz, M., TrAC Trends Anal. Chem, 121, (2019) 115662
[5] Zor, E. Talanta, 184 (2018) 149–155

Figures

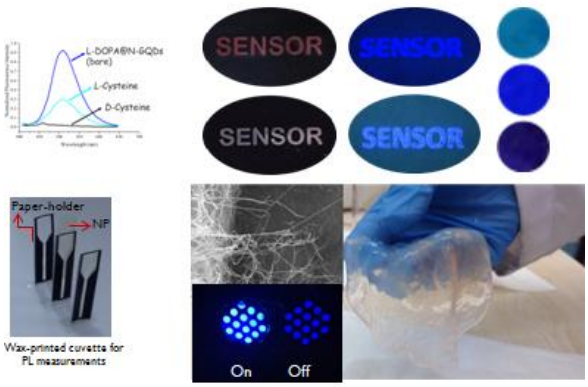

Figure 1: Nanomaterials-enriched nanopaper-based optical chiral sensors