

Chirality of Materials: A Guided Tour

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I will review our studies of the chirality of materials, which span over experimental research, over computational and theoretical studies, and over the re-evaluation of some basic concepts associated with this structural property. The main topics to be covered include:

I. The formation of chiral materials and their physical properties: From elementary chiral building blocks to complex chirality of amorphous and crystalline materials.

II. Chiral recognition: In photoprocesses; in heterogeneous catalysis; in enzymatic activity; in chromatographic separations; and in enantioselective imprinting.

III. Concepts evaluation and development: The quantitative evaluation of the degree of chirality; The chirality of random complex systems; the problem of labeling as left or right; and more.

The lecture will show how these three fields are interconnected and will emphasize resulting generalizations. The leading examples will be based on SiO₂-based materials, their porosity, their films, their interfaces and their skeletal structures.