"Chiral Discrimination in the solid-state"

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04\textsuperscript{th} of October 2017 - Salle de Conseil (Salle Mauve) - Faculté de Chimie

In 1848 Louis Pasteur found that the optically inactive tetrahydrated sodium ammonium tartrate is actually an equimolar mixture of (+) and (-) components. This is the landmark experiment which represents the birth of stereochemistry. In modern terms we will say that he found the first conglomerate: the first spontaneous chiral discrimination in the solid state. On top of that he could resolve this 50-50 mixture by recognition of the hemihedrism of the crystals enabling hand sorting. This lecture is devoted to the extension of that seminal work by considering in sequence the last developments of both the thermodynamic aspect and the crystallographic aspect. Fast pre-detection of conglomerates by using nonlinear optics (SHG) will be detailed.

Macroscopic symmetry breaking by using crystallization of enantiomers will be considered: deracemization and preferential enrichment.