

## Surface-induced amplification of enantiomeric excess in chiral adsorbates

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Chemical reactions leading to the amplification of enantiomeric excess may have played a part in the processes that lead to the homochirality of the biomolecular building blocks of life on Earth. The surfaces of inorganic materials that probably predate the formation of complex organic molecules on Earth can serve to concentrate organic species simply by adsorption. Such surfaces can also serve as sites for amplification of enantiomeric excess among chiral adsorbates.

While there are common minerals with chiral bulk structures and, therefore, chiral surface structures, chirality of the bulk structure of a material is not a prerequisite for chirality of a surface exposed by that material. Metals with highly symmetry bulk crystal structures can, nonetheless, expose crystal planes with chiral atomic structure (Figure). These surfaces exhibit enantiospecific interactions and chemistry with chiral molecular adsorbates.

There are a variety of surface chemical phenomena that could, and in some case have been shown to lead to amplification of enantiomeric excess of mixture of chiral organic compounds. The lecture will describe several such processes and our current understanding of the mechanisms that lead to amplification of enantiomeric excess on surfaces. These processes include: imprinting chirality into the structures of achiral surfaces, enantiospecific explosion reactions on chiral surfaces, and auto-amplification of enantiomeric excess by adsorption on achiral surfaces.

