

Separation and characterization of stereoisomers of a dinuclear tricarbonylrhenium(I) complex: Chiral chromatography, supercritical vs. liquid

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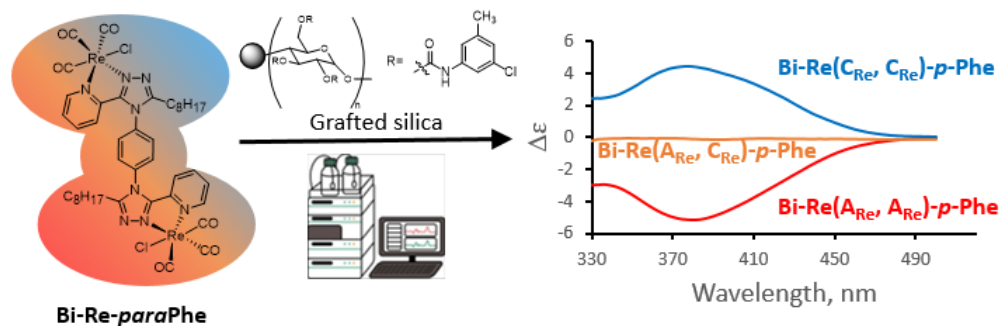
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Chirality plays a pivotal role in modulating the biological and physicochemical properties of molecules, making it a key parameter in fields such as advanced material development, fine chemistry¹, and agrochemistry.

Tricarbonylrhenium(I) complexes are gaining increasing attention due to their stability, low toxicity, and unique physicochemical properties¹. Naturally chiral, these complexes exhibit enhanced structural complexity when forming dinuclear assemblies, introducing additional levels of diastereoisomerism and enantiomerism. The presence of multiple chiral centers not only enhances their potential for diverse applications² but also poses significant challenges for their separation.

In this study, we report for the first time the efficient separation³ and comprehensive characterization of the two enantiomers and the meso diastereoisomer of the recently synthesized⁴ dinuclear tricarbonylrhenium(I) complex, Bi-Re-paraPhe. The chirality of this complex arises exclusively from its two metallic centers linked by a phenyl bridge. The performance of chiral chromatography separation is compared in both supercritical and liquid mobile phases. This methodological advancement represents a significant step forward in mastering metallic chirality, opening new perspectives for applications where precise chiral control is essential.



References

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