chiroptical

induced circular dichroism

D. P. IWANIUK, C. WOLF* (GEORGETOWN UNIVERSITY, WASHINGTON, USA)

A Stereodynamic Probe Providing a Chiroptical Response to Substrate-Controlled Induction of an Axially Chiral Arylacetylene Framework

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A Well-Oiled Stereodynamic Probe

Significance: A series of Sonogashira crosscoupling reactions is employed in the synthesis of the aryl-acetylene stereodynamic probe 1, which was obtained in 62% overall yield. While 1 is achiral, condensation with chiral di- or monoamines produces axially chiral diimines (e.g. 2). Because of the unhindered rotation in 1 (blue arrows) the central-to-axial chirality induction is essentially 'frictionless'.

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Comment: Extraordinary chirality amplification and strong Cotton effects were observed, and were used for in situ induced circular dichroism (ICD) analysis of a variety of chiral amines. CD amplitudes showed linear dependency on % ee, and enantiomeric excess was determined within 4% of the actual values for trans-1,2-diaminocyclohexane, and within 5.5% for the isopinocampheylamine.