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Intramolecular Interactions In Paracyclophanes

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Abstract

Since its discovery in 1949 by Brown and Farthing, paracyclophane has been intensely studied by chemists. Consisting of two benzene rings bound together by two ethano bridges, the paracyclophane core can undergo chemical transformations specific to both aliphatic and aromatic compounds, resulting in a wide variety of functionalized paracyclophanes. Because of the rigid molecular framework provided by the paracyclophane moiety and its short interannular distance, functional groups in *pseudo-geminally* substituted paracyclophanes are often held in such a position as to allow highly specific reactions to take place between them. Both the parent hydrocarbon and its derivatives have been used in asymmetric catalysis, optoelectronics and polymer synthesis. Acetylene-substituted paracyclophanes are important because of the ability of the acetylene moiety to easily undergo coupling and addition reactions, leading to new derivatives that contain one or more units of the paracyclophane core. Orthogonal π-bridges have been introduced into paracyclophanes by the reaction of the *pseudo-geminal* bisacetylene with various monoacetylenes and nitriles. Mono, *pseudo-gem* and *pseudo-para* ethynylcyclophanes and bis(azides) have been employed as addition partners in CuAAC reactions to design and build complex extended molecular scaffolds. The reactivity of the resulting triazoles was investigated under photochemical conditions. A variety of newly substituted paracyclophanes were identified; deazotization of *pseudo-gem* and *pseudo-para* adducts provided indolophane derivatives. A photochemical rearrangement from a *pseudo-para* adduct to a *pseudo-ortho* product was identified.

Biography

Birsa M L is currently a Professor in the Department of Chemistry at the Alexandru Ioan Cuza University of Iasi, Romania. From 2000 to 2002, he was a postdoctoral fellow under the mentorship of Professor Samuel Braverman at Bar-Ilan University, Israel. In 2003 he was selected as a member of the Alexander von Humboldt Foundation, working with Professor Henning Hopf in TU Braunschweig - Germany. Since then numerous return fellowships were granted by the Alexander von Humboldt Foundation.

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