Issue 88 July 2024

The I.S.H.C. Bulletin

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Issue 88 July 2024

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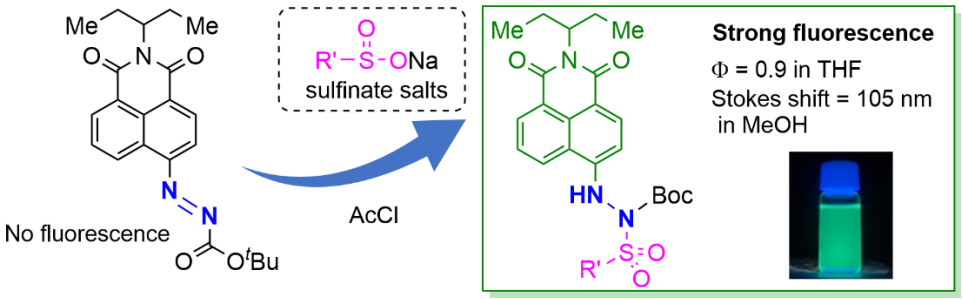
Synthesis of Naphthalimide Azocarboxylates Showing Turn-on Fluorescence by Substitution Reaction With Sulfinates

*Hiroki Tanimoto, Shogo Kyogaku, Aoi Otsuki, Takenori Tomohiro

Chem. Asian J. **2024**, *19(9)*, e202400145. (DOI: 10.1002/asia.202400145)



The addition reaction of sulfinates to naphthalimide-substituted azocarboxylates we synthesized afforded the corresponding sulfonyl hydrazides with high fluorescence quantum yields (up to 0.91 in THF and 0.54 in methanol), which exhibited a large Stokes shift (105 nm) in protic methanol solvent, while the unsubstituted hydrazide and the sulfonyl-position isomer showed no fluorescence in polar solvents.

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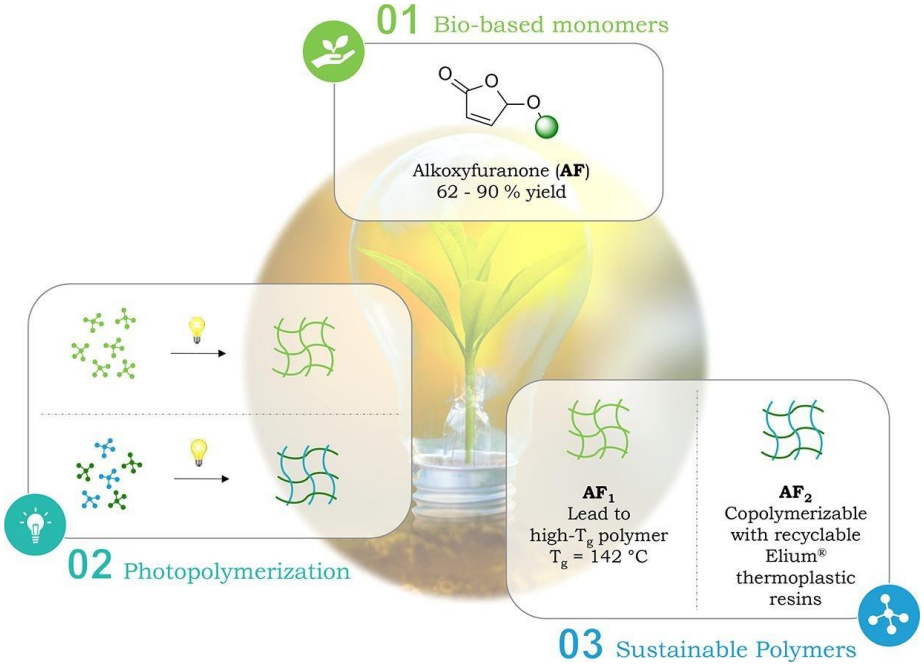
New monomers or co-monomers based on the alkoxyfuranone Scaffold: Toward new alternatives to Petroleum-Based structures

Marie Le Dot, Mario Andrés Gómez Fernández, Anne Langovist, Bruno Charrière, Pierre Gérard, Frédéric Dumur, Norbert Hoffmann, Jacques Lalevée

Eur. Polym. J **2024**, *215*, 113259. https://doi.org/10.1016/j.eurpolymj.2024.113259



Over the past decade, the circular economy has become a key component of sustainability due to environmental issues and more stringent environmental regulations. In this connection, the valuation of bio-based monomers possessing innovative structures remains an important challenge. Furthermore, several goals must be achieved: 1) the homopolymerization of such bio-based monomers by free radical photopolymerization which requires small energy inputs with limited emission of volatile organic compounds (COV) and 2) their copolymerization with Elium® thermoplastic resins to increase biogenic carbon in these novel low-viscosity methacrylic resins developed by Arkema. The challenge will be, in this context, to maximize the biomass carbon content while maintaining or even surpassing the properties exhibited by their petrochemical counterpart. In this work, a series of alkoxyfuranones derived from furfural have been synthesized. The four alkoxyfuranones (**AF_1**, **AF_2**, **AF_3** and **AF_4**) varying by the functionality of the side chains (but-3-en-1-yl, acrylate, isopropyl and ethyl) attached via acetalization of the 5-hydroxy-2(5H)-furanone were studied as potential monomers or co-monomers for free radical polymerization. The synthesis of **AF_1** and **AF_2** has never been reported in the literature. The homopolymerization of two of them (**AF_1** and **AF_2**) was successfully achieved, but only one led to a high-glass transition temperature (T_g) bio-based polymer. On the other hand, copolymerization with Elium® thermoplastic resins was obtained with different ratios of **AF_2** as a co-monomer. As a result, the expected gain value, such as faster photopolymerization was successfully obtained. Nevertheless, the copolymerization doesn't lead to obtaining high-T_g polymers.

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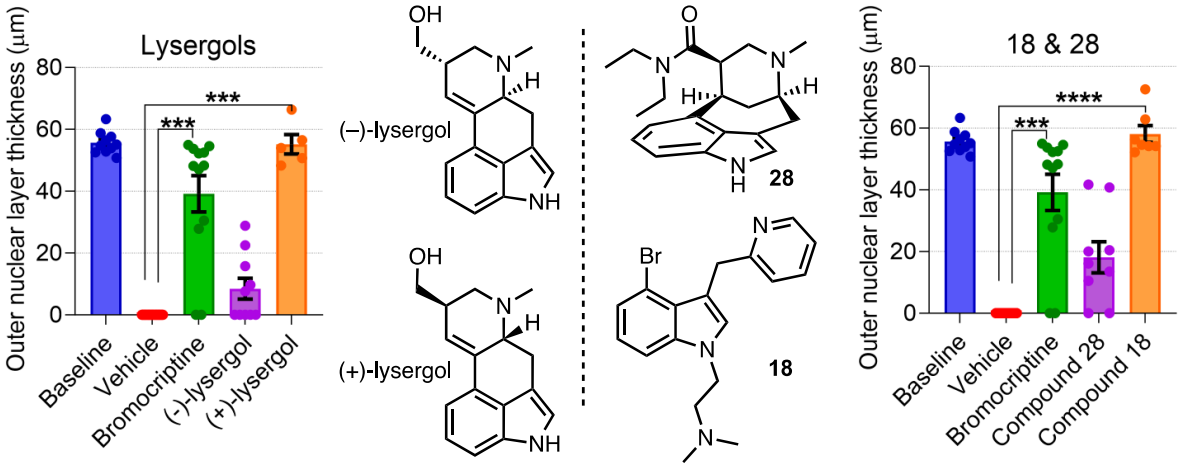
Synthesis and Biological Analysis of *Iso*-Dimethyltryptamines in a Model of Light-Induced Retinal Degeneration

Ethan J. Pazur, Anna Kalatanova, Nikhil R. Tasker, Katri Vainionpää, Henri Leinonen, and Peter Wipf

ACS Med. Chem. Lett. ***2024***, *ASAP* **DOI**: 10.1021/acsmedchemlett.4c00130

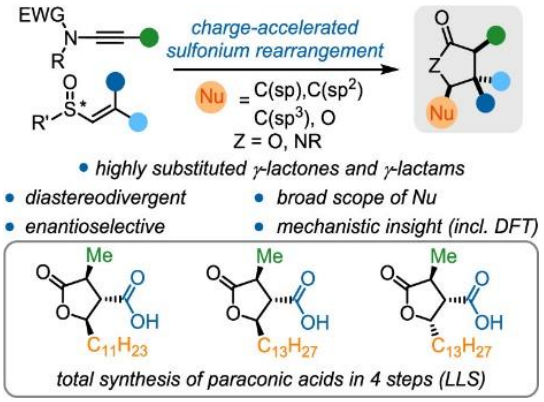


Employing our previously published hydrogen-autotransfer alkylation reaction of indoles, we prepared a series of *iso*-dimethyltryptamines (isoDMTs) and tested them for protection against retinal degeneration in comparison with natural and synthetic clavine alkaloids, including (+)- and (–)-cycloclavine, (+)- and (–)-lysergols, and (+)- and (–)-isolysergols. Based on measurements with optical coherence tomography and electroretinography in a model of light-induced retinal degeneration (LIRD), we discovered several compounds that showed better efficacy than than the positive control, bromocriptine. These studies provide further insights into the role of serotonin receptors in LIRD and the potential therapeutic applications of ergot alkaloids and isoDMTs in ocular diseases.

Stereodivergent Synthesis of 1,4-Dicarbonyl Compounds through Sulfonium Rearrangement: Mechanistic Investigation, Stereocontrolled Access to γ-Lactones and γ-Lactams, and Total Synthesis of Paraconic Acids

Nicolas G.-Simonian, Philipp Spieß, Margaux Riomet, Boris Maryasin, Immo Klose, Alexander Beaton Garcia, Laurin Pollesböck, Dainis Kaldre, Uroš Todorovic, Julia Minghua Liu, Daniel Kaiser, Leticia González, and Nuno Maulide*

J. Am. Chem. Soc. **2024**, *146*, 13914–13923; DOI: 10.1021/jacs.4c01755



Although simple γ-lactones and γ-lactams have received considerable attention from the synthetic community, particularly due to their relevance in biological and medicinal contexts, stereoselective synthetic approaches to more densely substituted derivatives remain scarce. The in-depth study presented herein, showcasing a straightforward method for the stereocontrolled synthesis of γ-lactones and γ-lactams, builds on and considerably expands the stereodivergent synthesis of 1,4-dicarbonyl compounds by an

ynamide/vinyl sulfoxide coupling. A full mechanistic and computational study of the rearrangement was conducted, uncovering the role of all of the reaction components and providing a rationale for stereoselection. The broad applicability of the developed tools to streamlining synthesis is demonstrated by concise enantioselective total syntheses of (+)-nephrosteranic acid, (+)-rocellaric acid, and (+)-nephromopsinic acid.
