

AUSTRALIAN JOURNAL OF CHEMISTRY

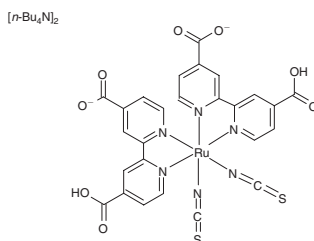
AN INTERNATIONAL JOURNAL FOR CHEMICAL SCIENCE

Rapid Communications

Convenient Synthesis and Purification of $[\text{Bu}_4\text{N}]_2[\text{Ru}(4\text{-carboxy-4-carboxylate-2,2'-bipyridine})_2(\text{NCS})_2]$: a Landmark DSC Dye

Tristan Rawling, Florian Buchholz,
Andrew M. McDonagh

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Dye-sensitized solar cells (DSSCs) rely on the ability of the sensitizing dye to absorb sunlight and then inject electrons into a meso-porous titania electrode. The dye $[\text{Bu}_4\text{N}]_2[\text{Ru}(4\text{-carboxy-4-carboxylate-2,2'-bipyridine})_2(\text{NCS})_2]$ (N719) has emerged as an excellent sensitizer and this paper presents a convenient synthesis of isomerically pure N719. The reported synthesis allows researchers relatively straightforward access to pure N719 as a standard for DSSC testing, and the synthetic strategy may be applied to a wide range of related complexes.

How to Analyze Ionic Liquid Anions? Investigation into the Application of Suppressed and Non-Suppressed Ion Chromatography

Piotr Stepnowski,
Aleksandra Markowska

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In this study, two reliable and accurate methods have been developed for the quantitative and qualitative determination of ionic liquid anions based on suppressed and non-suppressed ion chromatography. The reported method enables anions' concentrations to be tracked in ionic liquid mixtures with organic solvents, their residues in batch reactors, traces in environmental and biological matrices, or residues in products and wastes.

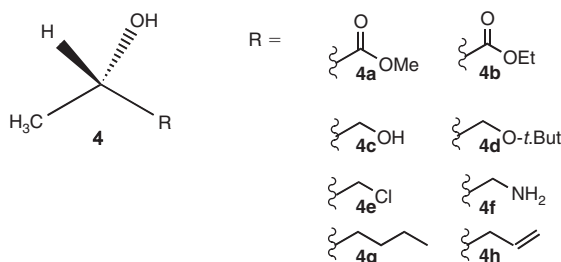
Full Papers

Solvent-Induced Chirality in the Hydroboration of Ketones

Christoph Baldauf, Nina Dickerhof,
Stefan H. Hüttenhain, Stefanie Kern,
Nancy Krummrich, Friedrich Kruse,
Janine May, Melanie Meister,
Kristina Müller, Sabine Rauer,
Isabelle Salwig, Nico Scharfenecker,
Birgit Spitznagel

Aust. J. Chem. **2008**, *61*, 414–418.

The solvent-induced enantioselective hydroboration of acetophenone in the presence of various Lewis acids is reported. Lactic acid methyl ester, as solvent, in combination with ZnCl_2 or ZnI_2 had the greatest impact on the enantiomeric excess and conversion. The extension of these conditions to other ketones revealed that the asymmetric induction was higher with aromatic ketones.

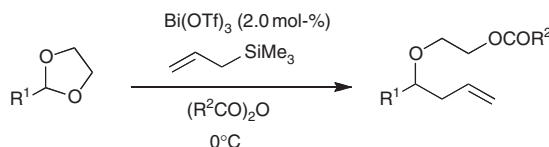


Environmentally Friendly Organic Synthesis Using Bismuth Compounds. Bismuth Trifluoromethanesulfonate-Catalyzed Allylation of Dioxolanes

Matthew J. Spafford,
James E. Christensen,
Matthew G. Huddle, Joshua R. Lacey,
Ram S. Mohan

Aust. J. Chem. **2008**, *61*, 419–421.

Bismuth triflate (2.0 mol-%) has been used to catalyze a multicomponent reaction involving the allylation of dioxolanes followed by in situ derivatization with anhydrides to yield highly functionalized esters under solvent-free conditions. To date, most reagents (such as TiCl_4 or AlCl_3) used for allylation of dioxolanes are highly corrosive and often required in stoichiometric amounts. This methodology, in contrast, uses a relatively non-toxic and non-corrosive bismuth(III)-based catalyst and thus is especially attractive for scale-up.



Aminimides as Potential CNS-Acting Agents. III. Design, Synthesis, and Receptor Binding of Aminimide Analogues of Dopamine, Serotonin, Morphine, and Nicotine

Ben Capuano, Ian T. Crosby,
Edward J. Lloyd, Juliette E. Neve,
David A. Taylor

Aust. J. Chem. **2008**, *61*, 422–431.

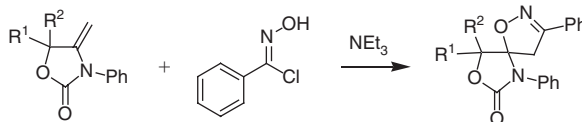
The synthesis of aminimide analogues of dopamine, serotonin, morphine, and nicotine is described. Aminimides are reported to improve physicochemical drug-like properties and it was of interest to investigate their affinity for their respective receptors. The nicotine aminimide analogue showed promising affinity for the nicotinic acetylcholine receptor, an ion channel, whereas the other analogues showed a marked reduction in affinity for their respective G-protein coupled receptors.

Regioselective 1,3-Dipolar Cycloaddition Reactions of 4-Methylene-2-oxazolidinones with Benzonitrile Oxide

Rebecca Newton, G. Paul Savage

Aust. J. Chem. **2008**, *61*, 432–437.

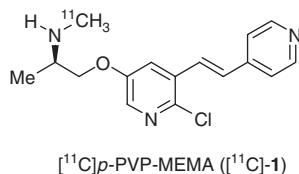
The 1,3-dipolar cycloaddition reaction of nitrile oxides with carbon dipolarophiles is a versatile and powerful synthetic method to prepare isoxazolines and isoxazoles. 4-Methylene-2-oxazolidinones undergo 1,3-dipolar cycloaddition reactions with benzonitrile oxide to give the corresponding spiro heterocycles, with complete regioselectivity and approximately 5:1 facial selectivity.



Synthesis and In-Vivo Evaluation of [^{11}C]p-PVP-MEMA as a PET Radioligand for Imaging Nicotinic Receptors

Frédéric Dollé, Sandrine Langle,
Gaëlle Roger, Roger R. Fulton,
Béatrice Lagnel-de Bruin,
David J. Henderson, Françoise Hinnen,
Taliesha Paine, Mark J. Coster,
Heric Valette, Michel Bottlaender,
Michael Kassiou

Aust. J. Chem. **2008**, *61*, 438–445.

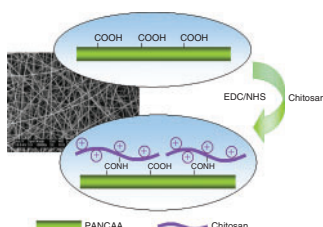


The radiosynthesis with carbon-11 ($t_{1/2}$ 20.4 min) of a novel high affinity neuronal nicotinic acetylcholine receptor ligand {(R)-2-[6-chloro-5-((E)-2-pyridin-4-ylvinyl)pyridin-3-yloxy]-1-methylethyl} methylamine (p-PVP-MEMA) is reported here, as well as its preliminary in vivo evaluation in the baboon brain using positron emission tomography.

Preparation and Surface Modification of Poly(acrylonitrile-co-acrylic acid) Electrospun Nanofibrous Membranes

Ai-Fu Che, Xiao-Jun Huang,
Zhen-Gang Wang, Zhi-Kang Xu

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Poly(acrylonitrile-co-acrylic acid) electrospun nanofibrous membranes were fabricated and surface modified with chitosan. Porous materials with the potentiality of pure chitosan were thus obtained. The hemocompatibility of the studied nanofibrous membranes was primarily evaluated by platelet adhesion experiments.

Direct-Current Methods for the Estimation of Corrosion Rates in Aqueous Timber Preservatives

Gareth Kear, Hài-Zhèn Wú,
Mark S. Jones, Frank C. Walsh

Aust. J. Chem. **2008**, *61*, 455–465.

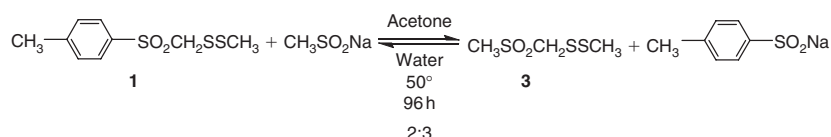
The recent introduction of wood preservatives containing relatively high concentrations of cupric ion, in comparison with copper–chrome–arsenate (CCA), is causing considerable international concern with regard to metallic durability. A critical review of direct current electrochemical analyses for the measurement of corrosion rates in aqueous solution has been carried out using CCA, copper azole (CuAz) and alkaline copper quatarnary (ACQ) preservatives. The results show that (1) hot-dipped galvanized zinc is an active material in terms of the polarization behaviour, especially within the CCA-based electrolyte, and (2) despite previous assumptions, neither polarization resistance nor Tafel slope-based analyses are suitable methodologies for the universal derivation of absolute values of corrosion rate in aqueous preservatives.

The Displacement of RSO₂ Groups from Tetrahedral Carbon

Stephen Duffy, Richard F. Langer

Aust. J. Chem. **2008**, *61*, 466–471.

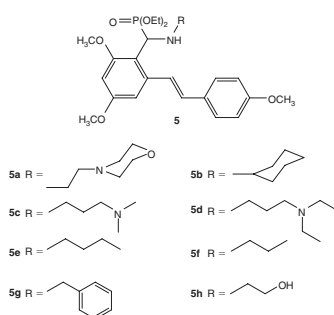
Based on observations that sulfone sulfonyl groups are expelled during E2 eliminations and that modern molecular orbital computations describe the bond between the carbon and the sulfonyl group as being strongly polarized, here the first example of a nucleophilic attack that displaces a sulfonyl group from C(sp³) has been determined experimentally. Such reactions may be useful in future to prepare biologically active sulfur-containing compounds.



Synthesis of α-Aminoalkyl Phosphonate Derivatives of Resveratrol as Potential Antitumour Agents

Lei Shi, Xian-Feng Huang,
Zhen-Wei Zhu, Huan-Qiu Li, Jia-Yu Xue,
Hai-Liang Zhu, Chang-Hong Liu

Aust. J. Chem. **2008**, *61*, 472–475.

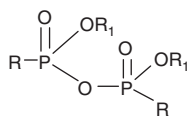


Eight α-aminoalkyl phosphonate derivatives of resveratrol were prepared and evaluated for their antitumour activities in vitro. These compounds showed good cytotoxic activity against a human nasopharyngeal epidermoid tumour cell line KB but weak cytotoxic activity against a human normal cell line L02. The potent antitumour activities shown by compounds **5c** and **5d** make these resveratrol phosphonate derivatives of great interest for further investigations.

Microwave Induced Synthesis of O,O-Dialkyl Dialkylpyrophosphonates under Solvent Free Conditions: Markers of Nerve Agents

Rajesh Kumar, Deepak Pardasani,
Avik Mazumder, Devendra K. Dubey,
Arvind K. Gupta

Aust. J. Chem. **2008**, *61*, 476–480.



The verification analysis of chemical warfare agents (CWAs) and related compounds has led to new efficient synthetic procedures. Here, the microwave assisted synthesis of O,O-dialkyl dialkylpyrophosphonates (compounds often produced when highly toxic chemical warfare agents are prepared in any laboratory or plant) is reported to give clean high yielding samples to aid in analysis.