

AUSTRALIAN JOURNAL OF CHEMISTRY

AN INTERNATIONAL JOURNAL FOR CHEMICAL SCIENCE

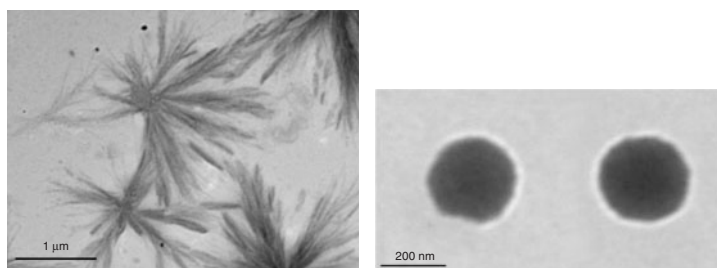
Rapid Communication

Formation and Stabilization of Anisotropic Palladium and Platinum Nanoparticles in Aqueous Polymer Solution Using Microwave Irradiation

Angshuman Pal, Sunil Shah,
Debjani Chakraborty,
Surekha Devi

Aust. J. Chem. **2008**, *61*, 833–836.

Microwave irradiation is used to quickly and effectively generate anisotropic palladium and platinum nanoparticles (NPs) by reduction of the corresponding metal ions with hydrazine using polyacrylamide as a stabilizing agent in aqueous medium. ‘Star-shaped’ palladium NPs are formed, whereas redox catalytically active spherical platinum NPs with a 3–4 nm coating of polyacrylamide are obtained.



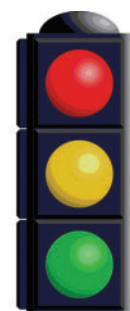
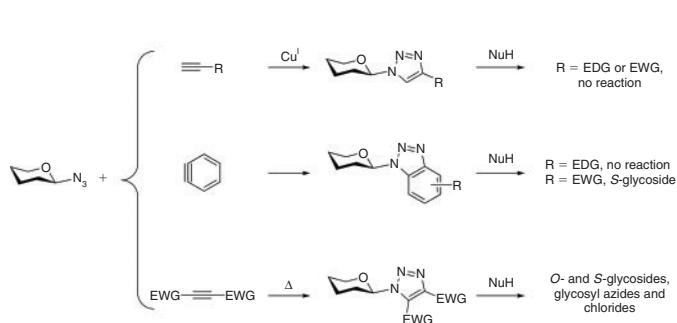
Full Papers

‘Click’ Preparation of Carbohydrate 1-Benzotriazoles, 1,4-Disubstituted, and 1,4,5-Trisubstituted Triazoles and their Utility as Glycosyl Donors

Jacinta A. Watt, Carlie T. Gannon,
Karen J. Loft, Zoran Dinev,
Spencer J. Williams

Aust. J. Chem. **2008**, *61*, 837–846.

Glycosyl azides are precursors to a range of glycosyl triazoles through various ‘click’ reactions. Trisubstituted triazoles are good glycosyl donors, disubstituted triazoles are inert, and only glycosyl benzotriazoles bearing electron-withdrawing groups can act as glycosyl donors. Thus, the number and nature of electron-withdrawing substituents on the triazole group appear to dictate their ability to act as leaving groups.

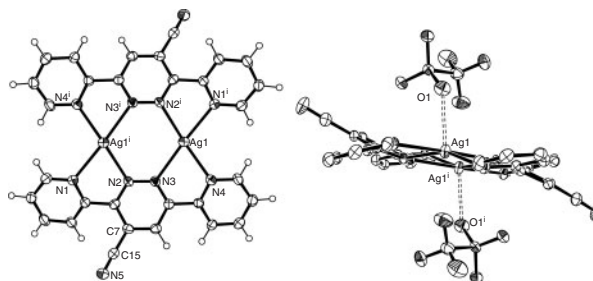


4-Substituted 3,6-Bis(2-pyridyl)pyridazines: Silver(I) Complexes of 4-Cyano- and 4-(4-Bromophenyl)-3,6-bis(2-pyridyl)pyridazine and Pseudopolymorphs of 1,3,5-Tris{3,6-bis(2-pyridyl)pyridazin-4-yl}benzene

Edwin C. Constable,
Catherine E. Housecroft,
Markus Neuburger, Sébastien Reymann,
Silvia Schaffner

Aust. J. Chem. **2008**, 61, 847–853.

Silver(I) binding to 4,5-disubstituted 3,6-bis(2-pyridyl)pyridazine ligands gives mononuclear, dinuclear, pentanuclear, or polymeric species. Here silver(I) complexation by 4-cyano-3,6-bis(2-pyridyl)pyridazine **2**, 4-(4-bromophenyl)-3,6-bis(2-pyridyl)pyridazine **3**, and 1,3,5-tris{3,6-bis(2-pyridyl)pyridazin-4-yl}benzene **4** is reported. In $[\text{Ag}_2(\mathbf{2})_2]^{2+}$ (see fig.) and $[\text{Ag}_2(\mathbf{3})_2]^{2+}$ the two ligands adopt a head-to-tail and a head-to-head arrangement, respectively. Complexes with **4** are highly insoluble powders.

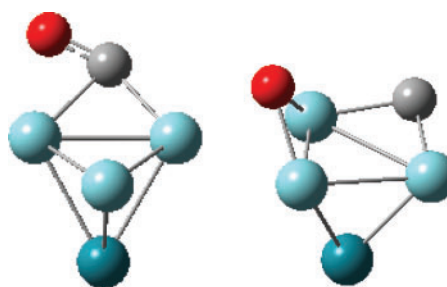


Computational Study of CO Reactivity with Nb_3X Heteronuclear Clusters

Matthew A. Addicoat,
Gregory F. Metha

Aust. J. Chem. **2008**, 61, 854–859.

The binding of CO to a series of doped niobium clusters is investigated. Density functional calculations are performed to determine the equilibrium structures, ionization potentials, and electron affinities of the Nb_3X clusters and the equilibrium structures and binding energies of the associatively and dissociatively bound products of the $\text{Nb}_3\text{X} + \text{CO}$ reaction. All the clusters thermodynamically dissociate CO.

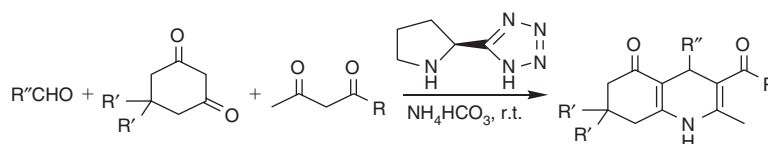


5-Pyrrolidin-2-yltetrazole-Promoted One-Pot Hantzsch Polyhydroquinoline Synthesis Using NH_4HCO_3 as Nitrogen Source

Weike Su, Jia Li, Jianjun Li

Aust. J. Chem. **2008**, 61, 860–863.

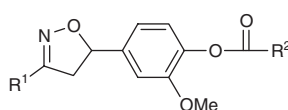
The synthesis of Hantzsch compounds, using an organocatalyst at ambient temperature and under solvent-free conditions, remains of interest in organic synthesis. 5-Pyrrolidin-2-yltetrazole, combining both mild Lewis acidity and lipophilic properties, has been utilized for the synthesis of such compounds. This approach is broadly applicable, avoids organic solvents, and is environmental friendly with a simple workup procedure.



Novel 5-(3-(Substituted)-4,5-dihydroisoxazol-5-yl)-2-methoxyphenyl Derivatives: Synthesis and Anticancer Activity

Xin-Hua Liu, Bao-An Song,
Pinaki S. Bhadury, Hai-Liang Zhu,
Ping Cui, Ke-Ke Hou, Hong-Li Xu

Aust. J. Chem. **2008**, 61, 864–869.



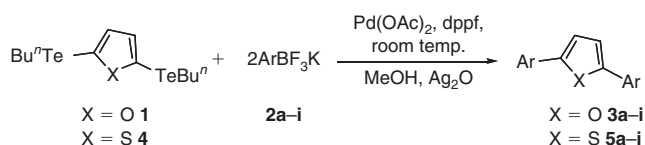
With the view to develop new and potent inhibitors with anticancer activity, a series of novel 5-(3-(substituted)-4,5-dihydroisoxazol-5-yl)-2-methoxyphenyl derivatives that contain a fluorinated functionality have been synthesized. The compounds were evaluated for their antiproliferative activities and, e.g., compound **6ah** (see fig.) was found to be highly effective against PC-3 cells (IC_{50} $1.5 \pm 0.02 \mu\text{g mL}^{-1}$) and A431 cells (IC_{50} $2.5 \pm 0.18 \mu\text{g mL}^{-1}$).

Synthesis of 2-Aryl- and 2,5-Diarylfurans and Thiophenes by Suzuki–Miyaura Reactions Using Potassium Trifluoroborate Salts and Heteroaryltellurides

Giancarlo V. Botteselle,
Thomas L. S. Hough, Raphael C. Venturoso,
Rodrigo Cella, Adriano S. Vieira,
Helio A. Stefani

Aust. J. Chem. **2008**, *61*, 870–873.

Heterobiaryls have important biological properties, and biaryl unit-containing compounds have far reaching applications. Here, more than 20 examples of 2,5-diaryl and 2-arylheteroaryl species have been prepared in 30–73% overall yield by a new approach that consists of a palladium-catalyzed cross-coupling reaction between organotellurium compounds and potassium aryltrifluoroborate salts.

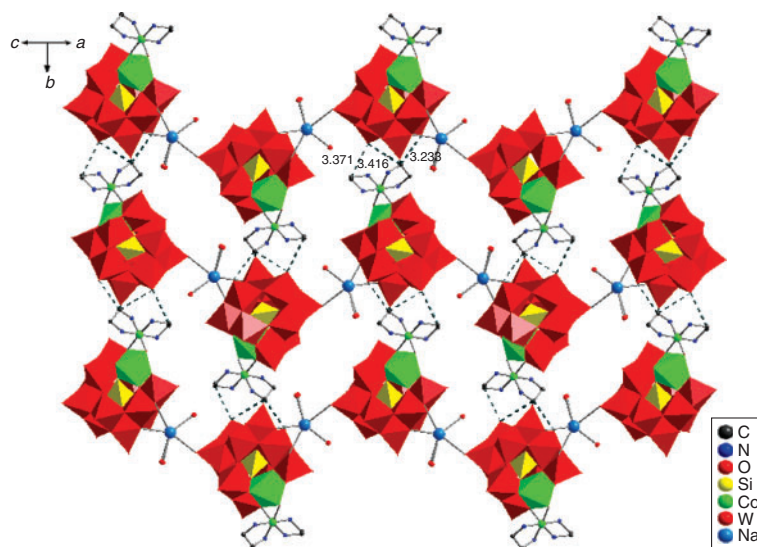


Two Interesting One-Dimensional Chainlike Architectures Formed by Substituted Keggin Polyoxoanions and Novel Cobalt–Ethylenediamine Complexes

Yu Wang, Zhiming Zhang, Enbo Wang,
Yanfei Qi, Song Chang

Aust. J. Chem. **2008**, *61*, 874–880.

Two novel α -Keggin heteropolyanion-supported transition metal complexes $\text{NaH}_3[\text{Co}^{\text{III}}(\text{en})_2(\text{OH})\text{SiW}_{11}\text{Co}^{\text{II}}\text{O}_{39}]\cdot 9.25\text{H}_2\text{O}$ **1** and $[\text{Co}(\text{en})_2]_4[\text{Co}_4(\text{Hen})_2\text{Si}_2\text{W}_{18}\text{O}_{68}]\cdot \text{H}_2\text{en}\cdot 6\text{H}_2\text{O}$ **2** have been synthesized and characterized. Compound **1** exhibits a 1D chainlike architecture, which further assembles into a 2D supramolecular layer (see fig.). In compound **2**, trivacant Keggin polyanions are linked through a tetrameric cobalt unit, which coordinates with en ligands.

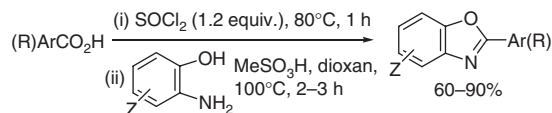


One-Pot Synthesis of 2-Substituted Benzoxazoles Directly from Carboxylic Acids

Dinesh Kumar, Santosh Rudrawar,
Asit K. Chakraborti

Aust. J. Chem. **2008**, *61*, 881–887.

Benzoxazole-containing compounds exhibit a broad range of biological activities. Here the synthesis of 2-substituted benzoxazoles by the one-pot reaction of 2-aminophenol with acid chlorides, generated in situ from carboxylic acids, is reported. Using methanesulfonic acid as the catalyst, this versatile reaction is environmentally benign and relatively inexpensive, which makes it highly attractive.



Nucleophilic Attack on the Carbon–Nitrogen Double Bond Leading to Tetrahedral Intermediates with Conformationally Restricted Stereochemistry

James E. Johnson, Lei Lu, Yi Li,
Mei Hou, Jeffrey E. Rowe

Aust. J. Chem. **2008**, *61*, 888–893.

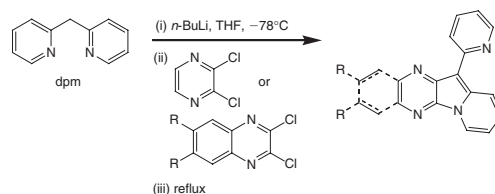
The mechanism and the stereochemical outcome of nucleophilic substitution at carbon–nitrogen double-bonded systems with conformationally restricted tetrahedral intermediates were investigated. The *E*-hydroximoyl bromide and chloride may be forming a zwitterionic intermediate that leads to product or the chair conformation of the intermediate may be undergoing a ring flip to a boat conformation with antiperiplanar electron pairs that assist in the ionization of the bromide or chloride ion. The elimination of chloride ion or bromide ion from the intermediates may not require assistance from any lone pair on a heteroatom bonded to the carbon–nitrogen double bond.

Ruthenium(II) Complexes of New Chelating Indolizino[2,3-*b*]pyrazine- and Indolizino[2,3-*b*]quinoxaline-Derived Ligands: Syntheses, Electrochemistry and Absorption Spectroscopy

Christopher J. Sumby

Aust. J. Chem. **2008**, *61*, 894–904.

The synthesis of novel conjugated heterocyclic ligands as components of energy conversion schemes is a topical area of research. Indolizino[2,3-*b*]pyrazine- or quinoxaline-based chelating ligands have been synthesized in one pot with good yields (see scheme), and ruthenium(II) bipyridine, copper(II) and silver(I) complexes of those ligands prepared. The influence these redox-active ligands have on the photophysical and electrochemical properties of the ruthenium(II) complexes was studied.

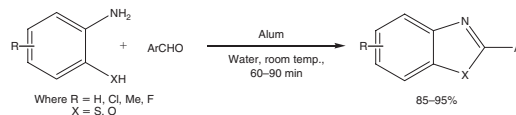


Alum (KAl(SO₄)₂·12H₂O)-Catalyzed, Eco-Friendly, and Efficient One-Pot Synthesis of 2-Arylbenzothiazoles and 2-Arylbenzoxazoles in Aqueous Medium

Shivaji S. Pawar, Deepak V. Dekhane, Murlidhar S. Shingare, Shivaji N. Thore

Aust. J. Chem. **2008**, *61*, 905–909.

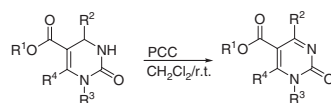
Alum (KAl(SO₄)₂·12H₂O) represents as a novel catalyst for the synthesis of 2-arylbenzothiazoles and 2-arylbenzoxazoles from *o*-aminothiophenol and *o*-aminophenol with various substituted aldehydes in good to excellent isolated yields using water as a solvent at ambient temperature. Several solvents were examined for this reaction; however, in terms of reaction yield and time, water was found to be the optimum solvent. The remarkable advantages offered by this method are an inexpensive and easily available catalyst, a simple procedure, mild conditions, much faster reactions, and good to excellent yields of products.



An Efficacious Protocol for the Oxidation of 3,4-Dihydropyrimidin-2(1*H*)-ones using Pyridinium Chlorochromate as Catalyst

Kamaljit Singh, Kawaljit Singh

Aust. J. Chem. **2008**, *61*, 910–913.



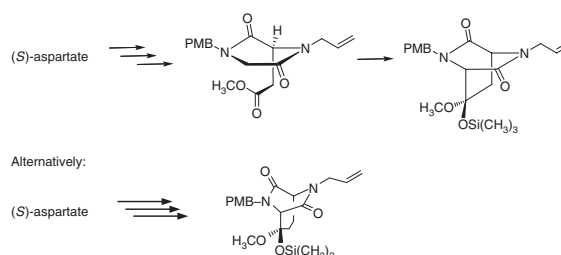
4-Unsubstituted as well as 4,6-aryl/alkyl-3,4-dihydropyrimidin-2(1*H*)-ones can be readily oxidized to corresponding pyrimidinones under neutral conditions using pyridinium chlorochromate.

Synthesis of 2,5-Diazabicyclo[2.2.2]octanes by Dieckmann Analogous Cyclization

Ralph Holl, Mareike Dykstra, Martin Schneiders, Roland Fröhlich, Masato Kitamura, Ernst-Ulrich Würthwein, Bernhard Wünsch

Aust. J. Chem. **2008**, *61*, 914–919.

Starting with (*S*)-aspartate methyl (*S*)-2-[1-allyl-4-(4-methoxybenzyl)-3,6-dioxopiperazin-2-yl]acetate is synthesized as educt for a Dieckmann analogous cyclization. The yield of the bicyclic cyclization product **13** is rather low, which is explained by the higher energy of the more constrained system **13** and the reduced conformational flexibility of the shorter acetate side chain.



Focus

Scanning Tunnelling Microscopy-Based Break Junction as a Tool in Rapid Measurement of Single-Molecule Conductance

Wenrong Yang

Aust. J. Chem. **2008**, *61*, 920.

This Focus article provides a brief review of an Scanning Tunnelling Microscopy-based break junction recently developed for measurement of single-molecule conductance. This technique opens the door for a variety of systematic studies of families of molecular systems to better understand how to predict and control the conductance of a molecular junction, and will help to establish a basic test platform that is necessary towards the effort of building molecular electronic devices.