

Applied Organometallic Chemistry

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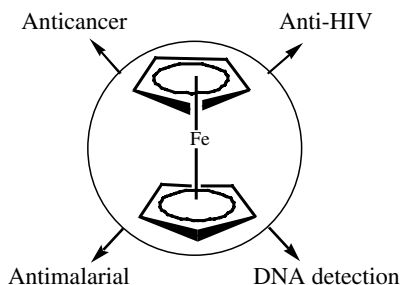
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Section: Bioorganometallic Chemistry

The use of ferrocene in bioorganometallic chemistry has been growing rapidly, and several promising applications have been developed since ferrocene is a stable compound, nontoxic and has good redox properties. This review will focus on ferrocenyl compounds which have been biologically evaluated against certain diseases. This area has attracted many researchers due to the promising results of some ferrocene compounds in the medicinal applications.



M. F. R. Fouda, M. M. Abd-Elzaher*, R. A. Abdelsamaia and A. A. Labib
..... 613–625

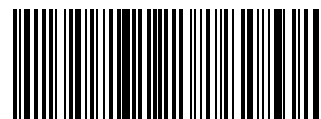
On the medicinal chemistry of ferrocene

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Identification statement

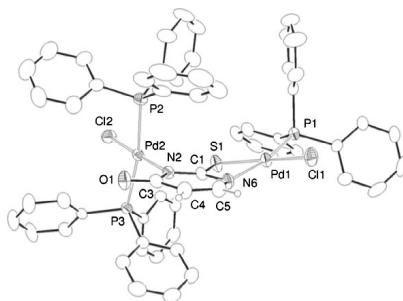
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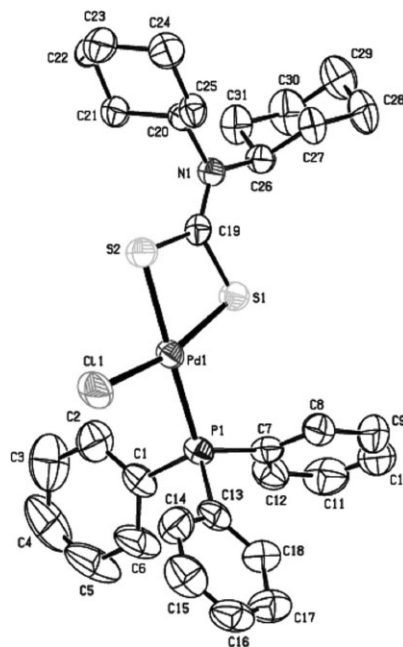
Square planar metallic and homonuclear bimetallic complexes of Pd(II) with 2-thiouracil (HTU) and organophosphines have been synthesized and characterized by FT-IR and multinuclear ^1H , ^{13}C , ^{31}P NMR spectroscopy. The thiouracil ligand TU acts as bidentate, is bound through the thioxo moiety and the endo amino group and forms a bridge between a $\text{PdCl}(\text{R}_3\text{P})$ and a $\text{PdCl}(\text{R}_3\text{P})_2$ moiety [$\text{R}_3\text{P} = \text{Ph}_3\text{P}$, (*o*-tolyl) $_3\text{P}$, ClPh_2P] in the homonuclear bimetallic complexes. The square planar geometry around Pd(II) has been confirmed for these complexes by a single-crystal X-ray diffraction study of compound **1**, $[\text{Pd}_2(\text{TU})(\text{PPh}_3)_3\text{Cl}_2]$. These compounds were also screened against human tumor cell lines and showed promising *in vitro* cytotoxicity.



F. Shaheen*, A. Badashah, M. Gielen*,
L. Marchio, D. de Vos and M. K. Khosa .
..... 626–632

Synthesis, characterization and in vitro cytotoxicity of homobimetallic complexes of palladium(II) with 2-thiouracil ligands. Crystal structure of $[\text{Pd}_2(\text{TU})(\text{PPh}_3)_3\text{Cl}_2]$

Pd(II) complexes with organophosphines and dithiocarbamates derivatives of α -amino acids were synthesized by reacting N,N-dicyclohexyldithiocarbamate (DCHDTC, compounds **1–3**) and N-methylcyclohexyldithiocarbamate (MCHDTC, compounds **4–6**) with $(\text{R}_3\text{P})_2\text{PdCl}_2$ ($\text{R} = \text{Ph}$, *o*-tolyl, Ph_2Cl) in a 1 : 1 molar ratio. The complexes were characterized by elemental analyses, FT-IR, multinuclear (^1H , ^{13}C and ^{31}P) NMR and single X-ray crystallography showing that the dithiocarbamate acts as a bidentate ligand and binds to Pd(II) via two sulfur atoms resulting in a square planar geometry around Pd(II). The cytotoxicity of compounds **2**, **3** and **4** was determined *in vitro* against six human tumour cell lines, MCF7, EVSA-T, WIDR, IGROV, M19 MEL, A498 and H226. The compounds **3** and **4** showed a moderate to low cytotoxicity whereas compound **2** exhibited a very low cytotoxicity. The results of antifungal assays showed that compounds **1–6** possess antifungal activity against *Fusarium moniliformes*, *Fusarium saolani*, *Mucor sp.*, *Aspergillus niger* and *Aspergillus fumigatus*. The anti-inflammatory screening results of **1–6** are quite similar to the one observed for the standard drug Declofenac at 10 mg/kg, which inhibited the oedema by 74% after 4 hours.



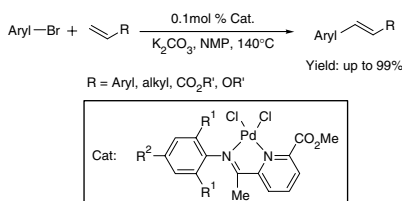
F. Shaheen*, A. Badshah, M. Gielen*,
C. Gieck and D. de Vos 633–640

Synthesis, characterization and in vitro cytotoxicity of palladium(II) complexes with mixed ligands. X-ray diffraction study of $\text{C}_{31}\text{H}_{36}\text{ClNPPdS}_2$

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Section: Materials, Nanoscience and Catalysis

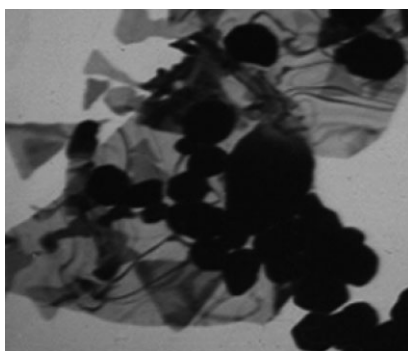
Seven different palladium (II) complexes containing pyridyl-imine ligands have been investigated as catalysts for the coupling between aryl bromide and olefin. The substituent on the benzene ring had significant influence on the catalytic properties. The catalyst **2** shows the highest reactivity of coupling reaction with aryl bromide in NMP with K_2CO_3 at $140^\circ C$.



W. Chen, C. Xi* and K. Yang 641–644

2-Iminopyridylpalladium dichloride as highly active catalyst for the Heck reaction

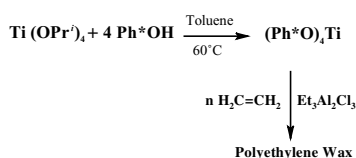
The polypeptide sequence MS14 (MHGK-TQATSGTIQS) was used to explore a new way of biomimetic preparation of gold nanoparticles and their aggregates. Extra reducing agent sodium citrate was introduced into the $HAuCl_4$ –MS14 system and uniformly dispersed nanoparticles under neutral condition were obtained.



Z. Wang, J. Chen*, P. Yang and W. Yang 645–651

Biomimetic synthesis of gold nanoparticles and their aggregates using a polypeptide sequence

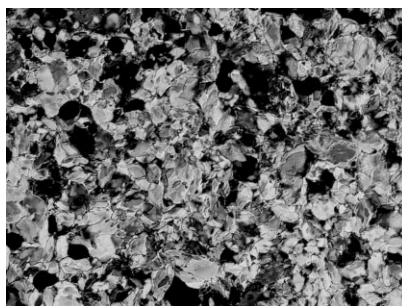
Soluble complexes of titanium containing bulky phenolic ligands were synthesized by an alcohol exchange reaction between $Ti(OPr^i)_4$ and the phenols. All these complexes were found to be active in polymerization of ethylene at high temperatures and pressures in combination with $Et_3Al_2Cl_3$ as co-catalyst. The polyethylene so obtained display very low molecular weights, narrow dispersities and high crystallinity.



P. S. Umare, A. J. Tiwari, R. Antony, G. L. Tembe* and B. Trivedi 652–660

Synthesis of ultra-low-molecular-weight polyethylene wax using a bulky Ti(IV) aryloxyde-alkyl aluminum catalytic system

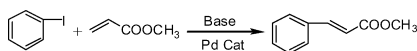
A series of Schiff bases containing ferrocene, with liquid crystalline properties, have been synthesized and characterized. The size of the rigid core of the substituent on ferrocene was found to play an important role in determining the thermal properties of these compounds.



I. Cârlescu, A. M. Scutaru, D. Apreutesei, V. Alupei and D. Scutaru* ... 661–669

The liquid crystalline properties of some ferrocene-containing Schiff bases

Palladium chloride anchored on functionalized MCM-41 was synthesized. The heterogeneous catalyst exhibited high catalytic performance in the Heck reaction of iodobenzene with methyl acrylate, giving 92% yield of methyl cinnamate. The heterogeneous catalyst was recycled six times without significant loss of activity and palladium leaching.

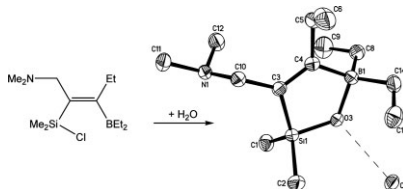


G. Z. Fan*, S. Q. Cheng, M. F. Zhu and X. L. Gao 670–675

Palladium chloride anchored on organic functionalized MCM-41 as a catalyst for the Heck reaction

Section: Main Group Metal Compounds

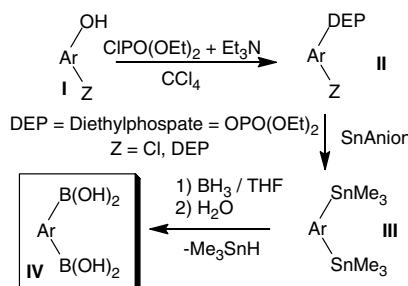
Alkenes bearing a chloro(dimethyl)silyl and a diethylboryl group in *cis*-positions at the C-bond;C bond together with a dimethylaminomethyl group in geminal position to the silyl group react with water or alcohols to give novel ammonium salts, 2,5-dihydro-1,2,5-oxoniaboratole derivatives.



B. Wrackmeyer*, T. Kupcik, O. L. Tok, K. Shahid and R. Kempe 676–681

Ionic 1,2,5-oxonia- and zwitterionic 1,2,5-oxasilaboratole derivatives. Synthesis and molecular structures

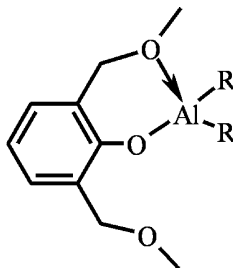
Phenols were converted into the aryl diethyl phosphates (II). Reaction of II with sodium trimethylstannide in liquid ammonia leads to the corresponding aryl- and heteroarylpoly(trimethylstannyl) derivatives (III). Organotin III react with borane in THF to give arylpolyboronic acids IV in ca 80% yield. The valuable arylboronic acids are obtained pure and uncontaminated by organotin residues and by other organic and inorganic boron derivatives as well as free of organic halides.



P. M. Fidelibus, G. F. Silbestri, M. T. Lockhart, S. D. Mandolesi, A. B. Chopra* and J. C. Podestá* 682–687

Three-step synthesis of arylpolyboronic acids from phenols via organotin compounds

Reactions between 2,6-(MeOCH₂)₂C₆H₃OH (LH) and trimethylaluminum in various ratios were studied. The products of these reactions were characterized with the help of ¹H, ¹³C NMR spectroscopy and X-ray diffraction. The PPO and ϵ -caprolactone polymerization activity of the L₂AlMe–B(C₆F₅)₃ system is also discussed.

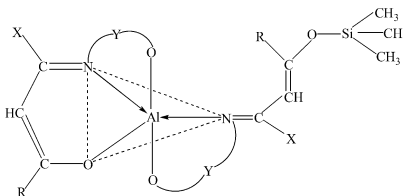


R = Me, or 2,6-(MeOCH₂)₂C₆H₃O

L. Dostál*, R. Jambor, I. Císařová, J. Merna and J. Holeček 688–693

Aluminum (III) complexes containing O,O chelating ligand

Some new type of mononuclear derivatives AILLH(1a-1d) of aluminium have been synthesized by 1:2 molar ratio by the reaction of Al(OPri)₃ and LH₂ [XC(NYOH)CH(R)OH], X = CH₃, Y = (CH₂)₂, R = CH₃ (L¹H₂); X = C₆H₅, Y = (CH₂)₂, R = CH₃ (L²H₂); X = CH₃, Y = (CH₂)₃, R = CH₃ (L³H₂); X = C₆H₅, Y = (CH₂)₃, R = CH₃ (L⁴H₂) in refluxing benzene. Reactions of AILLH with hexamethyldisilazane in 2:1 molar ratio yield some new ligand bridged heterodinuclear derivatives AILLSiMe₃(2a-2d). All these newly synthesized derivatives have been characterized by elemental analysis and molecular weight measurements. Tentative structures have been proposed on the basis of IR and NMR spectra (¹H, ¹³Cl, ²⁷Al and ²⁹Si) and FAB-mass studies. Schiff base ligand and their mono- and heterodi-nuclear derivatives with aluminium have been screened for their fungicidal activities. These compounds showed significant antifungal activity against *Aspergillus niger* and *A. flavus*.

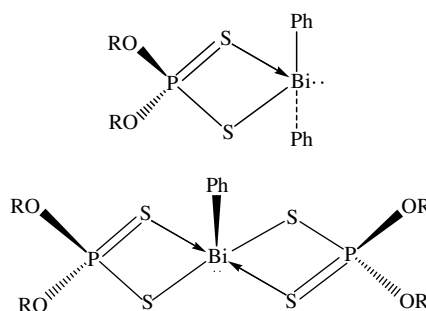


V. Vajpayee, Y. P. Singh*, D. Nandani and A. Batra 694–700

Mono- and heterodi-nuclear complexes of aluminium: synthesis, characterization and antifungal activity

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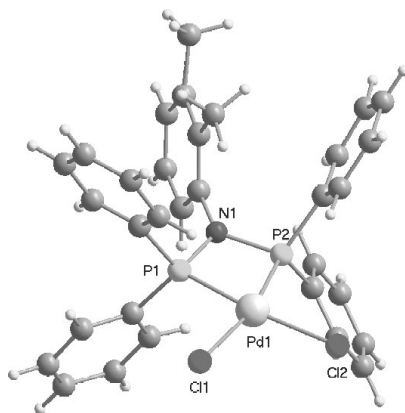
Ten dialkyldithiophosphate derivatives of phenylbismuth(III) of the type, $\text{Ph}_{(3-n)}\text{Bi}[\text{S}(\text{S})\text{P}(\text{OR})_2]_n$ [where $n = 1$; $\text{R} = \text{Me}$ (1), Et (2), Pr^i (3), Pr^n (4) and Bu^n (5); $n = 2$; $\text{R} = \text{Me}$ (6), Et (7), Pr^i (8), Pr^n (9) and Bu^n (10)] have been synthesized by the reactions of triphenyl-bismuth(III) with corresponding dialkyldithiophosphoric acids in 1:1 and 1:2 stoichiometric ratios, respectively, in stirred benzene solution. The newly synthesized brown colored compounds, 1–10 have been characterized by elemental analyses, molecular weight measurements, IR and NMR (^1H , ^{13}C and ^{31}P) spectral studies. The ligand diethyldithiophosphoric acid, $[(\text{C}_2\text{H}_5\text{O})_2\text{P}(\text{S})\text{SH}]$ and its organobismuth(III) derivatives, compounds 2 and 7 were administered to adult male rats by oral gavage at the dose of 25 mg per kg body weight per day, for 60 days, and their effects were evaluated and compared for changes in testicular morphology, circulatory concentrations of testosterone, FSH and LH, sperm dynamics, fertility index and testicular cell population dynamics.



P. K. Sharma, H. Rehwani, R. S. Gupta and Y. P. Singh* 701–710

The antispermatogenic activity of some phenylbismuth(III) O,O'-dialkyldithiophosphates

Crystal structures of *N,N*-bis(diphenylphosphino)-2,3-dimethylaniline-Pd(II) and *N,N*-bis(diphenylphosphino)-2-ethylaniline-Pd(II) complexes have been determined and the catalytic influence of the complexes was investigated in Heck reactions.



B. Gümgüm*, N. Biricik, F. Durap, I. Özdemir, N. Gürbüz, W. H. Ang and P. J. Dyson 711–715

*Application of *N,N*-bis(diphenylphosphino)aniline palladium(II) complexes as pre-catalysts in Heck coupling reactions*

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