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1. The influences of electrification on the ground-state structure of Ga7As7 cluster
By Yang, Jian-song

Using full-muffin-tin-orbital mol.-dynamics (FP-LMTO-MD) method, the energy and geometry changes of the ground-state structure of Ga7As7 cluster after charged were studied in detail. The results show that along with the increase of the degree of ionization, the cluster structure distortion becomes more obvious, and the pos. ion cluster will lose its stability faster than neg. ion cluster.

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2. Identification of halophilic archaea DSFD111
By Cheng, Lu-lu; Fu, Jin-chen; Yang, Dan-dan; Zhang, Han-wei; Yu, Shan-shan; Chen, Min

A halophilic archaea DSFD111 was identified based on morphol. and phylogenetic anal. The strain is Gram-neg. bacteria, no spores and contains lipid particles. The best growth environment of the strain is 37°C, pH 7 and 4.3 mol/L NaCl, which indicates that the strain is extreme halophiles. The phylogenetic anal. based on 16S rRNA gene homol. shows that the strain belongs to Haloarcula, and shares 99% similarity with Haloarcula argentinensis.

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3. Effects of elevated CO2 concentration on Rhytidium rugosum and Hylocomium splendens
By Zhao, Hong-yan; Hu, Zhong-jian; Ru, Ya-lu; Wu, Yu-huan
From Hangzhou Shifan Daxue Xuebao, Ziran Kexueban (2012), 11(6), 490-494. Language: Chinese, Database: CAPLUS, DOI:10.3969/j.issn.1674-232X.2012.06.003

The growth characteristics of Rhytidium rugosum and Hylocomium splendens in open-top chambers in Changbai Mountain were studied. Two kinds of mosses were planted with different CO2 concns. resp. The plant height of R. rugosum degraded but that of H. splendens increased in the treatment of 500 µmol · mol-1 CO2. With 700 µmol · mol-1 CO2 concn., the biomass of R. rugosum degraded while that of H. splendens increased, and both the ratios of biomass and plant height increased. The results indicate that H. splendens is much adapted to elevated CO2 concn. than R. rugosum, and elevated CO2 concn. stimulates moss's lateral growth much than vertical growth, but with unobvious changes in chlorophyll contents.

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4. Spectroscopic properties of a new BODIPY fluorescence probe
By Jiang, Lin; Cai, Li-bo; Zhou, Huan; Wang, Chan-juan; Zhang, Ming-fang; Dong, Lin; Yin, Shou-chun

The paper designed and synthesized a new BODIPY near-IR (NIR) fluorescent chemosensor 1, and researched on the responses of 1 to different metal ions by UV-visible absorption spectra and fluorescence spectra. The results show that among all tested metal ions (Na+, K+, Mg2+, Ca2+, Ba2+, Cu2+, Zn2+, Cd2+, Fe2+, Pb2+, Ni2+, Co2+, Hg2+, Ag+), 1 displays a high selectivity for Cu2+ upon excitation at 630 nm in CH3CN. The addn. of Cu2+ causes the appearance of a strong red absorption peak at 636 nm and a strong emission peak at 662 nm in CH3CN of 1. Meanwhile, because of the distinct color changes, 1 also can be used as the colorimetric senor for Cu2+.

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5. The synthesis of the thiazolyl-pyrazoline derivatives with 1,2,3-triazole moiety

By Chen, Fei; Liu, Fang-ming; Chen, Sen-lin; Dong, Zhi-qiang

Novel pyrazoline derivs. with 1,2,3-triazole and thiazole moiety were synthesized by the cyclization of 3,5-diphenyl-1-thiocarbamoylpyrazolines and 2-bromo-1-(2-phenyl-1,2,3-triazol-4-yl)ethanone in EtOH. The structure of these compds. was confirmed with IR, 1H NMR, mass spectral and elemental anal.

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6. The synthesis and properties of LiVP2O7

By Xu, Tu-gen; Zhou, Xiao-xiao; Gong, Jian-hang; Wang, Yi-li

The cathode material for lithium-ion battery with lithium vanadium pyrophosphate (LiVP$_2$O$_7$) was synthesized by the sol-gel method. XRD showed the material belonged to a monoclinic structure with lattice parameters $a = 4.804\,\text{Å}$, $b = 8.113\,\text{Å}$, $c = 6.939\,\text{Å}$, $\beta = 109.01^\circ$ (P2$_1$ space group). SEM test showed that the particles of the material were evenly distributed with the sizes of 500 nm-1 $\mu$m. The first discharge capacity of the material reached 91 mAh·g$^{-1}$ and the first columbic efficiency was over 93%. After 46 cycles, the discharge capacity still remained over 82 mAh·g$^{-1}$, which indicated the good cycle capability and reversibility.

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7. Retrotransposon-based molecular markers and their applications in plant researches

By Wang, Shang; Suo, Na-na; Zhao, Hong-yan; Feng, Shang-guo; Lu, Jiang-jie; Wang, Hui-zhong

A review. Retrotransposons, which are ubiquitous in the plant genome because of high copy no. and have high heterogeneity, can be used to study the plant genome as mol. markers. SSAP, IRAP, REMAP and RBIP are retrotransposon-based mol. markers. The paper summarized the principles, tech. procedures, characteristics and the applications in plant researches of the four mol. markers.

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8. The manufacture and practicality of cell culture-slide plate

By Pan, Hui-juan; Yin, Hong-ping; Chen, Gong-xing

To develop a biotechnol. product with integrated functions of cell culture and microscopy slide, the expt. designed and produced on a cell culture plate with 24 holes, cultivated the SW480 cell, stained and analyzed with Wright-Giemsa. The results show that the technol. product can perfectly integrate the cell culture with microscopy slide, which has innovative and practical value.

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9. The effects of vermicompost proportion on the growth and heavy metal accumulation of Euchlaena Mexicana Schrad

By Feng, Ping; Guo, Dan; Yao, Wu; Jia, Xiu-ying; Zhu, Wei-qin

The paper researched on the effects of vermicompost proportion to the growth as well as Cu, Zn absorption and accumulation characteristics of Euchlaena Mexicana Schrad with pot expt. The results show that the stems and leaves as well as roots develop optimally in the vermicompost with proportion resp. 50% and 75%. The vermicompost with proportion 50% or 75% is beneficial to the copper content of the stems and leaves of Euchlaena Mexicana Schrad, but has little influence on the zinc content, the copper and zinc content of roots increase along with the raise of vermicompost proportion. The copper and zinc accumulation of the stems and leaves are both high when the proportion is 50%, however, it is better for roots to accumulate the copper and zinc when the proportion is 75%. Therefore, the vermicompost proportion 50% is relatively conducive for Euchlaena Mexicana Schrad to repair the combined Cu, Zn pollution existed in vermicompost.

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10. Cloning expression and enzyme characterization of a cyclohexanone monooxygenase

By Zhai, Xiao-hong; Chen, Zhen-ming
From Hangzhou Shifan Daxue Xuebao, Ziran Kexueban (2012), 11(5), 397-402. Language: Chinese, Database: CAPLUS

To explore the biocatalytic properties of cyclohexanone monooxygenase (CHMO) in N. aromaticivorans the expt. cloned the gene chmo from N. aromaticivorans DSM 12444, and analyzed the enzyme characterization of its products. The length of the gene chmo was 1650 bp encoding a CHMO with 550 amino acid residues and calc'd. mol. mass of 61.6 kDa. The recombinant plasmid pET28a-chmo was constructed and functionally expressed in E. coli BL21 (DE3), resulting in the products with the size of 62 kDa. The recombinant CHMO could oxidize arom. sulfide and its derivs. chain sulfide as well as other sulfide and ketone substrates. The enzyme showed the highest activity against 2-chloro Et Ph sulfide, with $V_{\text{max}}$ of 25.65 U/mg. The optimal temp. was 55°C and optimal pH was 8.87, NADPH was inclined to be the coenzyme. These results indicate that the recombinant CHMO was a novel CHMO and might play a role in the oxidative depdrdn. of sulfide and ketones.

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11. S100b gene expression pattern in spinal cords

By Huang, Hao; Zhao, Xiao-feng; Qiu, Meng-sheng

S100b is a calcium binding protein implicated in many nervous system diseases, such as Alzheimer's disease, Parkinson's disease and Neuropathic pain, etc. The expt. used situ hybridization and immunofluorescence to analyze S100b expression in CNS. The results show that S100b is mainly expressed in the astrocytes of gray matter and the maturing oligodendrocytes in white matter of spinal cords, which indicates that S100b is not a good mol. marker for astrocytes.

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12. The structure and properties of PVDF/PA11/SiC nanocomposites with low thermal expansion coefficient
The polymeric materials with high dimensional stability attract significant attention for the wide applications. The paper fabricated the ternary PVDF/PA11/SiC nanocomposites by melt compounding, and analyzed the influence of SiC to the structure and properties of PVDF/PA11/SiC nanocomposites. The results show that the ASP compd. system has special hierarchical structure, and SiC exclusively locates in PA11 phase, there are small quantity nanometer microzones of PA11 in PVDF, meanwhile, the addn. of SiC will cause the changes of the structure of the PVDF/PA11/SiC nanocomposites. It is particularly important that SiC can not only effectively decrease the thermal expansion property of the mixt., but also enhance the tensile strength and modulus of the material.

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13. Advance in terpenoid microbial biosynthesis

By Gao, Yun-yun; Wang, Qiu-yan; Huang, Li-feng; Li, Hai-feng

A review. Terpenoid is a class of natural compds. with research and medicinal value. In recent years, the researches on terpenoid microbial biosynthesis have made great progress. Using the intermediates in the biosynthesis as clues, this paper summarized the research advance of terpenoid microbial biosynthesis by using the technol. of metabolic engineering, synthetic biol. and systematic biol.

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14. Effects of earthworm disposal on the bioavailability of heavy metals in soil

By Hu, An; Zhu, Wei-qin; Chen, Lin; Jia, Xiu-ying

Vermicomposting, which was a disposal technol. for waste and contaminants, was recently developed along with the deep exploitation of earthworm ecol. functions. The paper exposed the effects of the technol. on the bioavailability of heavy metals in soil from four different perspectives of earthworm ecol. differences, soil categories, heavy metal category differences as well as the change of pH and dissolved org. carbon (DOC), the results can provide refs. for future work.

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15. Cloning, sequence analysis and prokaryotic expression of glycosyltransferase gene in Bacillus pumilus

By Wang, Qiu-yan; Lan, Yuan-yan; Li, Hai-feng; Zhang, Ya-li; Huang, Li-feng

To get purified glycosyltransferase with catalytic ability, a full length sequence of GT-A gene was amplified by PCR reaction with genomic DNA in Bacillus pumilus as the template. The 1 287 bp sequence encoded a protein of 423 amino acid with mol. wt. of about 49.2 kD. Sequence anal. implied that the gene was a glycosyltransferase gene. Prokaryotic recombinant expression vector GTA-pet28a was constructed based on the ORF (open reading frame) of the glycosyltransferase gene and was expressed in Escherichia coli BL21 (DE3). A recombinant protein of about 50 kD was produced in the inducible expression system. The activity of the enzyme at 80 °C was 3.4 times higher than that at 37 °C. The results show that the glycosyltransferase is a thermophilic enzyme with potential applications.

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16. Synthesis and characterization of new 1, 5-benzothiazepine derivatives with 1, 2, 3-triazole moiety
By Chen, Sen-lin; Liu, Fang-ming; Dong, Zhi-qiang; Fei, Ting-hong; Huang, Le
A series of 1,5-benzothiazepine derivs. with 1,2,3-triazole moiety (5a-5d) and (7a-7c) were synthesized by 1,3-dipolar cycloaddn. of intermediate compd. (2) with benzohydroximinoyl (3a-3d) and hydrazonoyl chlorides (4a-4c) in the presence of triethylamine. The products have high purity and sepn. yield. The structures of these compds. (5) and (7) were confirmed by IR, 1H NMR, MS and elemental anal.

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17. The influencing factors on the synthesis of chiral pyrimidine sulfo-benzophenone compounds catalyzed by chiral primary amine-based organocatalyst in Biginelli reaction
By Zhou, Wei; Zhao, Jin-gang; Lin, Jing; Xu, Yan-xia; Liu, Jun; Zhao, Shu-juan; Xie, Tian
Chiral pyrimidine ketone compds. have important pharmacol. activities and broad applications in many fields. Chiral pyrimidine sulfo-benzophenone compds. with high enantioselectivity were obtained by the Biginelli reaction, which was catalyzed by chiral primary amine and metal salt. The results show that e.e. can be up to 69% and yield can be up to 76% under the influence of synergistic catalysis of NbCl$_5$ and QN-NH$_2$.

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18. Synthesis of 1,1-disubstituted-1,2-propadiene
By Hu, Lin-feng; Wang, Ping; Zhang, Yan-jing; Hong, Ya; Chen, Cong; Mao, Guo-liang; Zheng, Wei-xin
The 1,1-disubstituted-1,2-propadiene was synthesized via S$_2$N' reaction of Grignard reagent with sulfonic propargyl ester using alkyne as the raw material. The method has the advantages of readily available raw materials, mild conditions, few side reaction, high yields, et al. All products were verified by 1H NMR, 13C NMR, IR and MS.

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19. Synthesis of 1,2-dioxetane chemiluminescence reagent
By Jiao, Yan-hua; Guo, Wei-qiang; He, Rui; Liang, Yuan-yuan; Chen, Can-yu; Zhang, Peng-fei
The paper researched on the synthesis method of 1,2-dioxetane chemiluminescence reagent, discussed the effects of reaction temp., reaction time and molar ratio of reactants on productivity. Under optimal expt. conditions, the productivity rate of Me 3-hydroxybenzoate and 2-adamantanone through McMurry cross-coupling reaction exceeded 80% with TiCl$_4$ - Zn as the reductant.

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20. Effects of 6-BA and NAA in different concentration proportions on PLB induction of Cymbidium hybridum

By Zhang, Peng-cheng; Chen, Yu; Deng, Yan-fu; Chen, Zhi-juan; Shi, Nong-nong

Shoot-tips from Cymbidium hybridum were used as the explants to investigate the effects of 6-BA and NAA in different concn. proportions on PLB (protocorm-like body) induction, propagation and differentiation. The results show that the survival rate of shoot-tips is 93.3% in the concn. proportion of 1.0 mg/L 6-BA+0.5 mg/L NAA, the induction rate of PLB is 85.8% in the concn. proportion of 0.8 mg/L 6-BA+0.4 mg/L NAA, the propagation rate of PLB is 4.59 in the concn. proportion of 1.0 mg/L 6-BA+0.3 mg/L NAA, and the budding rate of PLB is 87.5% in the concn. proportion of 0.8 mg/L 6-BA+0.5 mg/L NAA. The optimized concn. proportion of 0.8 mg/L 6-BA+0.5 mg/L NAA can result in 8% higher ratio of PLB induction (80.8%) and differentiation (87.5%) than that with currently reported 72.7% and 76.7% resp.

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21. The synthesis and crystal structure of novel isoxazole derivatives containing pyrazole moiety

By Fei, Ting-hong; Zhou, Ying-lei; Liu, Fang-ming

In order to realize combination of multiform active ingredients and supply lead compd. for drug screening, sixteen new isoxazole derivs. contg. pyrazole moiety were synthesized at room temp. simple manipulation with pyrazoloformaldehyde 1 and phenylhydroximinoyl chlorides 3 as starting materials via condensation and cyclization reactions. These compds. were characterized by the elemental anal., 1H NMR, IR and MS. The single crystal X-ray study of 4,5-dihydro-3-phenyl-5-(1-phenyl-3-methyl-5-phenyloxyl-pyrazolo-4-yl)-4-(4-methoxy)-phenylisoxazololines 4c indicates that belongs to triclinic system, P1 space group, with a = 0.589 85(6) nm, b = 1.027 21(14) nm, c = 1.163 22(12) nm; α = 92.647(4)°, β = 98.497(3)°, γ=100.469(4)°; Dc = 1.287 mg · m³; L = 0.086 mm⁻¹; V = 0.683 52(14) nm³; F(000) = 278; Z=1; R1 = 0.087 8; wR2 = 0.178 5.

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22. Research on the preparation and bioelectrocatalysis property of bioelectrode with Au nanoparticle

By Liang, Yuan-yuan

The chitosan/gold/glucose oxidase electrode complex bioelectrode with gold nanoparticles was prepd. by the in-site supported method with chitosan as the formwork as well as Citric acid as the reducing agent. Characterizing the structure of the bioelectrode with the scanning electron microscope. The results show that the mean diam. of the gold nanoparticles is about 15 nm, which distribute evenly in the chitosan. Detecting glucose with the bioelectrode, the results show that GOD has favorable biocatalysis activity in complex film as well as rapid and sensitive response to glucose, the linear range is 0 to 30 µmol·L⁻¹ the correlated coeff. is greater than 0.9988, and the detection limit is 32 µmol·L⁻¹ (S/N=3).

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23. Hydrosilylation of alkenes catalyzed by MCM-48 supported chitosan-platinum complex

By Yang, Hu; Zhang, Shu-fang; Bai, Ying; Peng, Jia-jian; Li, Jia-yun; Lai, Guo-giao
A new Pt/CS-MCM-48 catalysts was prepd. from chitosan supported on MCM-48. The catalyst was characterized by XRD, IR and TG. The results indicated that coordination bond between platinum and nitrogen atom of chitosan was formed. Pt/CS-MCM-48 catalyst has favorable catalytic performance for the hydrosilylation of alkenes, the regioselectivity of adduct is above 90%, and the catalyst can be reused for 14 times without noticeable loss of activity.

24. Research advances of AFBR model
By Xing, Bao-shan; Jin, Ren-cun; Ma, Chun
A review. The anaerobic fluidized bed reactor (AFBR) is one of biofilm processes. It is filled with inertial granule as carrier, so that the surface is covered with biofilm. It has the advantages of larger sp. surface, high mass transfer rate and high concn. of suspended solids. Substantial existing researches are aimed at establishing math. models, optimizing the design of reactor and process control system to enhance the operational efficiency. This article summarized every math. models, and provided evidences for the optimization of AFBR design.

25. Cloning and sequence characteristics analysis of P450 gene from Spodoptera exigua (Lepidoptera: Noctuidae)
By Zheng, Xiao-xiao; Wei, Ping; Zhao, Li-na; Wang, Shi-gui; Dang, Xiang-li; Zhang, Qi-liang; Tang, Bin
In order to obtain P 450 gene sequence in Spodoptera exigua and analyze the tissue distribution, homol. coloning and RACE were adopted to colone the cDNA of Spodoptera exigua P 450. The full length of cDNA with calcd. mol. mass of 57.74 kD and pl of 8.01 is 2 565 bp, which includes an ORF of 1 515 nucleotides that encodes 504 amino acid residues and a 42 or 1 010 nucleotide for 5'- or 3'-non-coding region resp. It has two glycosylation sites, the 2 – 21 aa is transmembrane structure. Homologous comparison results indicate that SeP450 contains two conservative domains the same as the P 450 gene in other insects, including CAFG and AGET. SeP450 shares 74% identity with that of Helicoverpa armigera, which is the highest and the phylogenetic anal. shows that the two species are most closely related. The result of RT-PCR show that SeP450 mRNA is expressed in midgut, fat body and other tissues, with the highest expression level in the midgut.

26. The synthesis and characterization of a new fluorescent dye with BODIPY
By Liu, Bin; Xie, Dan-bo; Li, Qi; Jia, Jian-fei; Xu, Dan-ya; Huang, Jin-long; Yin, Shou-chun
A new fluorescent dye with BODIPY was synthesized and characterized by FTIR, NMR and MS, and the reaction conditions were optimized. The results show that in the iodo-substituted reaction, the yield can reach 87.7% when the amt. of I₂ equivalent to 1, 3, 5, 7, 8-pentamethyl BODIPY is 4 using I₂/HIO₃ as iodo reagent. In the Sonogashira coupling reaction, the yield can reach 57.7% if the amt. of palladium catalyst is 4% of diiodo-substituted BODIPY.
27. Researches on plant MYB transcription factors

By Liu, Shou-mei; Sun, Yu-qiang; Wang, Hui-zhong

A review. Regulation of gene expression at the transcription level or posttranscription level is one of the crucial processes involved in plant growth development and other physiol. functions. As one of the largest transcription factor (TF) families, MYB (v-myb avian myeloblastosis viral oncogene homolog) implicates in controlling cell development, cell cycling, responding to varieties of hormones and environmental signals, esp. in the processes of second metab. The paper reviewed the structure characters and functions of MYB so as to provide refs. for further study and utilization.

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28. Biotechnology application in herbal plant Tetrastigma hemsleyanum Diels et Gilg

By Du, Su-rui; Xiang, Tai-he; Li, Meng

A review. Tetrastigma hemsleyanum Diels et Gilg is one kind of rare and precious herbal plant, the extractives of which include flavone, β-sitosterol, polysaccharide and so on. It has excellent anti-tumor function and has already been clin. used in the treatments of cancer, HIV, nosohemia, cardio-cerebrovascular disease, hepatitis and viral meningitis. This paper reviewed the research progress of biotechnol. application in Tetrastigma hemsleyanum Diels et Gilg from the aspects of manual cultivations, rapid propagation and cell culture as well as medical bioactive ingredients anal., and looked forward to the direction of further studies.

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29. Synthesis and characterization of 3-phenyl-5-(2-phenylthio-quinolin-3-Yl)-1-(4-methoxyphenyl)-2-thiazoyl)-pyrazoline

By Zeng, Yong-ming; Liu, Fang-ming

The compd. 3-phenyl-5-(2-phenylthio-quinolin-3-yl)-1-(4-methoxyphenyl)-2-thiazoyl)-pyrazoline I was synthesized and the structure was detd. by X-ray single-crystal diffration. Moreover, the compd. has been confirmed by IR spectra, 1H NMR, MS and elemental anal.
30. Study on the enantiomeric separation of nicardipine, nimodipine and nitrendipine by capillary electrophoresis

By Cai, Cheng; Wang, Yuan-chao; Deng, Fei

Enantiosepn. methods of antihypertensive vasodilator nicardipine, nimodipine and nitrendipine were studied using cyclodextrin and its derivs. as chiral reagents. Many factors such as the type of chiral reagent and its concn., pH of buffer on resoln. (Rs) were investigated using high sulfonated cyclodextrin (HS-CD) as chiral recognition reagent with capillary zone electrophoresis, and the optimized conditions of enantiosepn. of nicardipine hydrochloride, nimodipine and nitrendipine were defined. The results indicate that nicardipine hydrochloride, nimodipine and nitrendipine are well sepd. with chiral reagent HS-γ-CD, HS-β-CD and HS-α-CD resp. The paper discussed their sepn. mechanisms.

31. Study on the synthesis and adhesive properties of polymethylphenylsiloxanes modified bisphenol-F epoxy resins

By Li, Mei-jiang; Wu, Ming-jun; Wu, Yan-jin; Hu, Zi-qiang; Lai, Guo-qiao

The organosilicon modified epoxy resins were prepd. by grafted polymn. of OH-terminated polymethylphenylsiloxanes (HO-PMPS) and Bisphenol-F Epoxy Resins. The influences of catalysts, reaction temp. and time on polymn. were discussed. The optimal reaction conditions are that the catalyst is Ph₃P, reaction temp. is from 120°C to 150°C, reaction time is from 7 h to 9 h. The influences of the ratio of polymethylsiloxanes on adhesive properties of modified epoxy resins were also discussed. The results show that the heat-resistance adhesive properties of modified epoxy resins significantly improved. The sample prepd. from 1 : 4 mass ratio of OH-PMPS to epoxy resin has its shear strength as high as 5.4 MPa after heat aging at 300°C for 12 h. Modified epoxy resins were characterized by means of FT-IR and TGA.

32. Preparation of 5-amino-1, 10-phenanthroline with hydrazine hydrate reduction method in presence of Pd/C catalyst

By Xu, Cun-jin; Qiu, Hua-yu; Shi, Yan-qin

5-Amino-1,10-phenanthroline I was prepd. by the redn. of 5-nitro-1,10-phenanthroline with hydrazine hydrate in presence of Pd/C catalyst, and characterized by IR, UV, ¹H NMR, MS and elemental anal. The paper investigated the influences of temp., time, and quantities of catalyst and hydrazine hydrate used on product yield. Under optimum conditions, parallel exptl. results show that the yield of 5-amino-1,10-phenanthroline can reach 92.9%. The redn. method of hydrazine hydrate in presence of Pd/C catalyst is a kind of environment-friendly and simple redn. method.
33. Research development of Chinese herb residues reusing

By Zhao, Zhen-kun; Wang, Shu-ling; Ding, Liu-tao; Xie, Tian; Sun, Yun-ting; Zeng, Zhao-wu; Zhan, Xiao-ri


A review with 42 refs., is given on Chinese herb residues reusing. In the modern society which advocates energy conservation, emission redn., low carbon and environmental protection, in order to provide a thought for exploiting Chinese medicine resources and making full use of Chinese herb residues, the paper reviewed the research development of Chinese herb residues reusing in recent ten years. Most Chinese medicines are from plants, Chinese herb residues contain crude fiber, crude protein, crude fat and many minerals. Recently, Chinese herb residues are reused in the extn. of other effective components, edible fungus cultivation, animal feed, fertilization, waste water treatment, biomass energy, papermaking materials and fermn. In-depth researches on the usages of Chinese herb residues can make it be reused deeply. It has significant meanings that Chinese medicine industry should follow the green and sustainable developing road, get low-carbon concept, make full use of resources, and form a new modern intensive industry of environmental protection.

34. Enzymatic reduction of α-hydroxy acids

By Lu, Dan-qing; Zhang, Zhao-hui; Chen, Zhen-ming


A review. Chiral α-hydroxy acids are important intermediate for the synthesis of drugs and pesticides. Various enzymic processes can be used into the synthesis of α-hydroxy acids. Ketoreductase is the most useful enzymes. This paper summarized the synthesis of α-hydroxy acids by ketoreductase.

35. Determination of anthocyanin in black rice by high performance liquid chromatography

By Ying, Long-bin; Yu, Sang-sang; Liu, Cui-ping; He, Ren-feng; Shou, Zhen-zhen; Hu, Gen-xin; Ouyang, You-nan; Shen, Bo


A method to detect anthocyanin contents in black rice with HPLC was presented. The black rice flour was extd. with Et acetate and petroleum ether under the assistance of ultrasound treatment followed by concn. Then, the ext. was analyzed by high performance liq. chromatog. A good linear relationship detd. by HPLC method was obsd. when anthocyanin concn. was 0.005 2-0.052 mg/mL (R² = 0.999 8). The av. recovery rate for anthocyanin was 99.72% with 0.91% of relative std. deviations (RSD), and the lowest limitation of anthocyanin was 0.1 ng/mL. The method, which is simple, stable and accurate, can be used for screening black rice varieties with high anthocyanin contents from black rice germplasm resources.

36. Synthesis of chiral benzopyran catalyzed by prolinol silyl ether
Chiral benzopyran is prepared with salicylaldehyde and cinnamaldehyde via oxa-Michael/aldol reaction. The factors influenced the reaction are investigated by comparing the effects of the ratios of solvent, small organic molecules, small organic bases, the mixed use of small organic molecules together with bases, silyl Lewis acids and molar ratio of salicylaldehyde to cinnamaldehyde on the reaction. The results show that with prolinol silyl ether as organocatalyst, dichloromethane as solvent, 4-chlorobenzoic acid as additive, and the molar ratio of salicylaldehyde to cinnamaldehyde 2:1, the yield can be achieved 93% with enantioselectivity 83%.

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37. Study on the Mechanical Properties of Wood-Plastic Composite Based on PP/PE

By Cai, Pei-xin; Lu, Qun; Liang, Meng-jie; Zhang, Qing-feng

Wood-plastic composite (WPC) based on PP/PE were prepared by extrusion with PP and HDPE blends as plastic matrix, EPDM as toughening agents, wood flour as filler. The paper researched on the effects of PP/PE and EPDM content on the mechanical properties of WPC. The results showed that with PP content increased in the plastic matrix, the flexural modulus of WPC increased, but the flexural strength and impact strength were decreased first and then increased. With EPDM content increased in the plastic matrix, the impact strength of WPC increased, the flexural strength and flexural modulus decreased.

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38. Viscosity reduction mechanism of Tween 80 on polyvinyl chloride plastisol

By Bian, Jie; Zhu, Gen-ping; Ye, Ting; Xu, Yu

Objective of this study is through the tests for different polyvinyl chloride plastisol viscosities and gelation time as well as the analysis on the adsorption of Tween 80 on the surface of paste resins, the paper discussed the possible function mechanism of the influences of surface active agent on paste degree. The results indicate that the gelation time of three kinds of plastisols is iso-Pr tri-Ph phosphate < diisononyl phthalate < di-iso-octyl adipate, but the plastisol viscosities are the exact opposite. The viscosity reduction effect of surface active agent Tween 80 on the plastisols is the best. The viscosity reduction mechanism of Tween 80 lies in its preferential adsorption on the surface of polyvinyl chloride paste resins, which impedes the adsorption, infiltration, swelling and dissolution of plastisol on the surface of paste resins, so that the gelation of plastisol is delayed. The saturated adsorption of Tween 80 is about 7.23 mg/100 g polyvinyl chloride resin.

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39. Synthesis, characterization of Ni(II) complexes with chiral tetraaza ligands and their application for asymmetric transfer hydrogenation of acetophenone

By Zhang, Tian; Tan, Hua-jie; Hong, Yi-ling; Shen, Liang

The experiments synthesized two chiral tetraaza ligands, (S,S,S,S)-N,N'-bis(2-p-toluenesulfonylamino-1,2-diphenylethyl)ethylenediamine (A) and (S,S,S,S)-N,N'-bis(2-p-toluenesulfonylamino-1,2-diphenylethyl)trimethylenediamine (B), and characterized their Ni(II) complexes by elemental analysis, 1H-NMR, MS and IR. The paper researched on the asymmetric hydrogen transfer reaction of acetophenone, and investigated the effects of the alkali charge and reaction time on asymmetric transfer hydrogenation.
40. Fabrication and application of titania modified microfluidic chip micro-reactor

By Ye, Mei-ying; Zhou, Gang; Li, Bao-xing; Liu, Jin-hua

The paper researched on the prep. method of nanosized titania film. The expt. applied titania film micro-fluidic chip in the channel by powder sol method, and obtained a photocatalytic micro-reactor with high catalytic activity and good stability. Using UV-LED as the light source, the photocatalytic degrdn. of fulvic acid and the photocatalytic org. reaction of benzaldehyde with ethanol were, proceeded in the micro-reactor. Under the conditions of incident light intensity 120 mW/cm², flow rate 100/µL/h, H₂O₂ concn. 2%, fulvic acid initial pH 1 and photoreaction time 192 s, the degrdn. rate of 2.5 g/L fulvic acid could reach 90 %. When the reaction time of the photocatalytic reaction of benzaldehyde and ethanol in the micro-reactor is 96 s, and light intensity is 0.8 m W/cm², the yield ratios of benzyl alc. and hydrobenzoin are 8.5 % and 65.2 % resp.