LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Karya Ilmiah (Artikel)	:	Hydrophobicity of silica thin films: the deconvolution and interpretation by Fourier-transform infrared spectroscopy
Jumlah Penulis	:	3 Orang Penulis ke : 2
Nama Penulis	:	Riza Eka Saputra, **Yayuk Astuti,** Adi Darmawan
Identitas Jurnal Ilmiah		
a. Nama Jurnal	:	Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy
b. Nomor ISSN	:	1386-1425
c. Volume, No, Bulan, Tahun	:	199, -, 14 Maret, 2018
d. Penerbit	:	Elsevier
e. DOI artikel (jika ada)	:	https://doi.org/10.1016/j.saa.2018.03.037
f. Alamat web jurnal	:	https://www.sciencedirect.com/science/article/abs/pii/S1386142518302415?via%3Dihub
g. Indexing	:	Scopus, Science citation index, Cambridge scientific abstracts, current contents-physical, chemical & earth sciences, INSPEC

Kategori Publikasi Jurnal Ilmiah : ☑ Jurnal Ilmiah ~~Internasional~~ / Internasional Bereputasi

(beri ✓pada kategori yang tepat) ☐ Jurnal Ilmiah Nasional Terakreditasi

☐ Jurnal Ilmiah Nasional/Nasional Terindeks di DOAJ, CABI

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah = 40					Nilai Akhir Yang Diperoleh
	Internasional Bereputasi	Internasional	Nasional Terakreditasi	Nasional Tidak Terakreditasi	Nasional Terindeks DOAJ dll.	
a. Kelengkapan unsur isi buku (10%)	4					3,5
b. Ruang lingkup dan kedalaman pembahasan (30%)	12					12
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12					12
d. Kelengkapan unsur dan kualitas penerbit (30%)	12					11,5
Total = (100%)	40					**39**
Kontribusi Pengusul (Penulis Anggota)						**(40%x39)/2 = 7,8**

Komentar Peer Review:

a. Artikel yang dimuat, dibahas dan disusun secara lengkap Kelengkapan dan kesesuaian unsur: Lengkap dan sesuai dengan yang dipersyaratkan jurnal internasional.
b. Ruang lingkup dan kedalaman pembahasan: Data yang disajikan dibahas dengan detil dan lengkap, disertai referensi pendukung
c. Kecukupan dan kemutahiran data/informasi dan metodologi: Kualitas dan kuantitas pustaka baik, sebagian besar tahun terbit kurang dari 10 th. Metodologi disajikan detil sehingga bisa diulang peneliti lain.
d. Kelengkapan unsur dan kualitas penerbit: Unsur penerbit lengkap dan kualitas terbitan sangat baik.
e. Indikasi Plagiasi: Tidak ada
f. Kesesuaian bidang ilmu: Sesuai dengan bidang ilmu penulis 2

Semarang,
Reviewer 1

Drs. Gunawan, M.Si., Ph.D
NIP. 196408251991031001

Unit kerja :
Departemen Kimia FSM Undip
Jabatan Fungsional: Lektor Kepala

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Karya Ilmiah (Artikel)	:	Hydrophobicity of silica thin films: the deconvolution and interpretation by Fourier-transform infrared spectroscopy
Jumlah Penulis	:	3 Orang Penulis ke : 2
Nama Penulis	:	Riza Eka Saputra, **Yayuk Astuti,** Adi Darmawan
Identitas Jurnal Ilmiah		
a. Nama Jurnal	:	Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy
b. Nomor ISSN	:	1386-1425
c. Volume, No, Bulan, Tahun	:	199, -, 14 Maret, 2018
d. Penerbit	:	Elsevier
e. DOI artikel (jika ada)	:	https://doi.org/10.1016/j.saa.2018.03.037
f. Alamat web jurnal	:	https://www.sciencedirect.com/science/article/abs/pii/S1386142518302415?via%3Dihub
g. Indexing	:	Scopus, Science citation index, Cambridge scientific abstracts, current contents-physical, chemical & earth sciences, INSPEC

Kategori Publikasi Jurnal Ilmiah : ☑ Jurnal Ilmiah ~~Internasional~~ / Internasional Bereputasi
(beri ✓pada kategori yang tepat) ☐ Jurnal Ilmiah Nasional Terakreditasi
☐ Jurnal Ilmiah Nasional/Nasional Terindeks di DOAJ, CABI

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah = 40					Nilai Akhir Yang Diperoleh
	Internasional Bereputasi	Internasional	Nasional Terakreditasi	Nasional Tidak Terakreditasi	Nasional Terindeks DOAJ dll.	
a. Kelengkapan unsur isi buku (10%)	4					4
b. Ruang lingkup dan kedalaman pembahasan (30%)	12					11,5
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12					12
d. Kelengkapan unsur dan kualitas penerbit (30%)	12					12
Total = (100%)	**40**					**39,5**
Kontribusi Pengusul (Penulis Anggota)	**40%x40=8 2**					**40%x39,5=7,9 2**

Komentar Peer Review:

a. Kelengkapan dan kesesuaian unsur: : Artikel lengkap dan telah sesuai template. Template terdiri dari pendahuluan, metode, hasil dan pembahasan, kesimpulan serta referensi.
b. Ruang lingkup dan kedalaman pembahasan: Ruang lingkup penelitian ini adalah spektroskopi thin films silica. Pembahasan telah menggunakan data pembanding.
c. Kecukupan dan kemutahiran data/informasi dan metodologi: Data sangat memadai dan data yang disajikan sesuai dengan tujuan penelitian. Jumlah referensi lebih dari cukup, 37,25% merupakan referensi yang terbit dalam range 5 tahun Ketika artikel diterbitkan
d. Kelengkapan unsur dan kualitas penerbit: Penerbit Elsevier memiliki reputasi yang sangat bagus dan sudah terindeks.
e. Indikasi Plagiasi: Tidak ada
f. Kesesuaian bidang ilmu: Sesuai dengan bidang ilmu penulis

Semarang,
Reviewer 2

Dr.M.Cholid Djunaedi, S.Si, M.Si.
NIP. 197007021996031004

Unit kerja :
Departemen Kimia FSM Undip
Jabatan Fungsional:
Lektor Kepala

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Karya Ilmiah (Artikel)	:	Hydrophobicity of silica thin films: the deconvolution and interpretation by Fourier-transform infrared spectroscopy
Jumlah Penulis	:	3 Orang Penulis ke : 2
Nama Penulis	:	Riza Eka Saputra, **Yayuk Astuti,** Adi Darmawan
Identitas Jurnal Ilmiah		
a. Nama Jurnal	:	Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy
b. Nomor ISSN	:	1386-1425
c. Volume, No, Bulan, Tahun	:	199, -, 14 Maret, 2018
d. Penerbit	:	Elsevier
e. DOI artikel (jika ada)	:	https://doi.org/10.1016/j.saa.2018.03.037
f. Alamat web jurnal	:	https://www.sciencedirect.com/science/article/abs/pii/S1386142518302415?via%3Dihub
g. Indexing	:	Scopus, Science citation index, Cambridge scientific abstracts, current contents-physical, chemical & earth sciences, INSPEC

Kategori Publikasi Jurnal Ilmiah : ☑ Jurnal Ilmiah ~~Internasional~~ / Internasional Bereputasi
(beri ✓pada kategori yang tepat) ☐ Jurnal Ilmiah Nasional Terakreditasi
☐ Jurnal Ilmiah Nasional/Nasional Terindeks di DOAJ, CABI

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi buku (10%)	3,5	4	3,75
b. Ruang lingkup dan kedalaman pembahasan (30%)	12	11,5	11,75
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12	12	12
d. Kelengkapan unsur dan kualitas penerbit (30%)	11,5	12	11,75
Total = (100%)	39	39,5	39,25
Kontribusi pengusul (penulis anggota)			**40%x39,25=7,852**

Semarang, April 2020

Reviewer 2

Dr. M. Cholid Djunaedi,. S.Si., M.Si.
NIP. 197007021996031004

Unit kerja :
Departemen Kimia FSM Undip

Reviewer 1

Drs. Gunawan, M.Si., Ph.D
NIP. 196408251991031001

Unit kerja :
Departemen Kimia FSM Undip

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Karya Ilmiah (Artikel)	:	Hydrophobicity of silica thin films: the deconvolution and interpretation by Fourier-transform infrared spectroscopy
Jumlah Penulis	:	3 Orang Penulis ke : 2
Nama Penulis	:	Riza Eka Saputra, **Yayuk Astuti,** Adi Darmawan
Identitas Jurnal Ilmiah		
a. Nama Jurnal	:	Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy
b. Nomor ISSN	:	1386-1425
c. Volume, No, Bulan, Tahun	:	199, -, 14 Maret, 2018
d. Penerbit	:	Elsevier
e. DOI artikel (jika ada)	:	https://doi.org/10.1016/j.saa.2018.03.037
f. Alamat web jurnal	:	https://www.sciencedirect.com/science/article/abs/pii/S1386142518302415?via%3Dihub
g. Indexing	:	Scopus, Science citation index, Cambridge scientific abstracts, current contents-physical, chemical & earth sciences, INSPEC

Kategori Publikasi Jurnal Ilmiah : ☑ Jurnal Ilmiah ~~Internasional~~ / Internasional Bereputasi
(beri ✓pada kategori yang tepat) ☐ Jurnal Ilmiah Nasional Terakreditasi
☐ Jurnal Ilmiah Nasional/Nasional Terindeks di DOAJ, CABI

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	**Nilai Maksimal Jurnal Ilmiah** ~~**Internasional**~~ **/ Internasional Bereputasi **** 40	**Nilai Akhir Yang Diperoleh**
a. Kelengkapan unsur isi buku (10%)	4	3,75
b. Ruang lingkup dan kedalaman pembahasan (30%)	12	11,75
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12	12
d. Kelengkapan unsur dan kualitas penerbit (30%)	12	11,75
Total = (100%)	**40**	**39,25**
Kontribusi pengusul (penulis anggota)		**40%x39,25 = 7,852**

Semarang, April 2020

Reviewer 2

Dr. M. Cholid Djunaedi,. S.Si., M.Si.
NIP. 197007021996031004

Unit kerja :
Departemen Kimia FSM Undip

Reviewer 1

Drs. Gunawan, M.Si., Ph.D
NIP. 196408251991031001

Unit kerja :
Departemen Kimia FSM Undip

Brought to you by Universitas Diponegoro

Source details

Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy

Formerly known as: Spectrochimica Acta - Part A Molecular Spectroscopy

Scopus coverage years: from 1995 to 2021

Publisher: Elsevier

ISSN: 1386-1425

Subject area: Physics and Astronomy: Instrumentation | Physics and Astronomy: Atomic and Molecular Physics, and Optics | Chemistry: Analytical Chemistry | Chemistry: Spectroscopy

CiteScore 2019
5.1

SJR 2019
0.550

SNIP 2019
1.088

View all documents > | Set document alert | Save to source list | Journal Homepage

CiteScore | CiteScore rank & trend | Scopus content coverage

Improved CiteScore methodology

CiteScore 2019 counts the citations received in 2016-2019 to articles, reviews, conference papers, book chapters and data papers published in 2016-2019, and divides this by the number of publications published in 2016-2019. Learn more >

CiteScore 2019

$$5.1 = \frac{\text{17,194 Citations 2016 - 2019}}{\text{3,373 Documents 2016 - 2019}}$$

Calculated on 06 May, 2020

CiteScoreTracker 2020

$$5.0 = \frac{\text{20,195 Citations to date}}{\text{4,052 Documents to date}}$$

Last updated on 07 September, 2020 • Updated monthly

CiteScore rank 2019

Category	Rank	Percentile
Physics and Astronomy — Instrumentation	#15/129	88th
Physics and Astronomy — Atomic and Molecular Physics, and Optics	#42/183	77th

View CiteScore methodology > | CiteScore FAQ > | Add CiteScore to your site

Brought to you by Universitas Diponegoro

Astuti, Yayuk

Universitas Diponegoro, Semarang, Indonesia Show all author info

57100033100 https://orcid.org/0000-0002-2107-3829 View Mendeley profile

Edit profile Set alert Potential author matches Export to SciVal

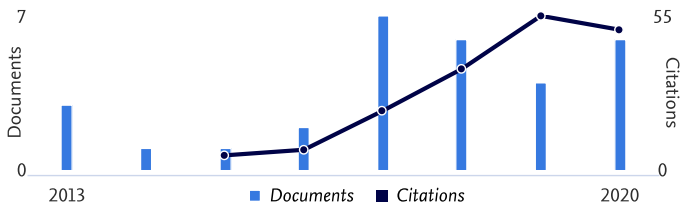
Metrics overview

30 Documents by author

177 Citations by ***151* documents**

7 *h*-index: View *h*-graph

Document & citation trends



Analyze author output Citation overview

Most contributed Topics 2015-2021

Bismuth Oxides; Photocatalytic Activity; Solid Oxide Fuel Cells
10 documents

Iodine Value; Activated Carbon; Palm Kernels
2 documents

Nanofiltration Membranes; Pervaporation; Water Flux
2 documents

View all Topics

30 Documents Cited by 151 Documents 64 Co-Authors Topics

Export all Add all to list Sort by Date (newest)

View list in search results format

View 618 references

Set document alert

Conference Paper • *Open Access*

Photocatalytic Performance of Bismuth Oxide Prepared by Citric Acid-Fueled Solution Combustion on Decolorisation of Organic Dye Molecules

0 Cited by

Astuti, Y., Anggraeni, D., Darmawan, A.

IOP Conference Series: Materials Science and Engineering, 2020, 833(1), 012061

View abstract View at Publisher Related documents

Brought to you by Universitas Diponegoro

Scopus Search Sources Lists SciVal ↗ Create account Sign in

Document details

Export Download Print E-mail Save to PDF Add to List More... >

View at Publisher

Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy
Volume 199, 15 June 2018, Pages 12-20

Hydrophobicity of silica thin films: The deconvolution and interpretation by Fourier-transform infrared spectroscopy (Article)

Saputra, R.E., Astuti, Y., Darmawan, A.

Diponegoro University, Department of Chemistry, Semarang, 50275, Indonesia

Abstract

View references (51)

This work investigated the synthesis of dimethoxydimethylsilane:tetraethoxysilane (DMDMS:TEOS) silica thin films as well as the effect of DMDMS:TEOS molar ratios and calcination temperature on hydrophobic properties of silica thin films and its correlation with the FTIR spectra behaviour. The silica thin films were synthesized by sol-gel method using combination of DMDMS and TEOS as silica precursors, ethanol as solvent and ammonia as catalyst, with DMDMS and TEOS molar ratio of 10:90, 25:75, 50:50, 75:25 and 90:10. The results showed that DMDMS:TEOS molar ratio had significant impact on the hydrophobic properties of silica thin films coated on a glass surface. Furthermore, the correlation between water contact angle (WCA) and DMDMS:TEOS molar ratio was found to be in a parabolic shape. Concurrently, the maximum apex of the parabola obtained was observed on the DMDMS:TEOS molar ratio of 50:50 for all calcination temperature. It was clearly observed that the silica xerogel exhibiting notable change in relative peak intensities showed FTIR peak splitting of $\upsilon_{asymmetric}$ Si-O-Si. To uncover what happened at the FTIR peak, the deconvolution was conducted in Gaussian approach. It was established that the changes in the Gaussian peak component were related to DMDMS:TEOS molar ratios and the calcination temperature that allowed us to tailor the DMDMS:TEOS silica polymer structure model based on the peak intensity ratios. With the increase of DMDMS:TEOS molar ratio, the ratio of (cyclic Si-O-Si)/(linear Si-O-Si) decreased, whilst the ratio of (C-H)/(linear Si-O-Si) increased. Both ratios intersected at DMDMS:TEOS molar ratio of 50:50 with contribution factor ratio of 1:16 and 1:50 for silica xerogel calcined at 300 °C and 500 °C respectively. The importance of this research is the DMDMS:TEOS molar ratio plays an important role in determining the hydrophobic properties of thin films. © 2018 Elsevier B.V.

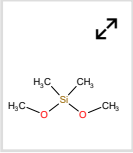
SciVal Topic Prominence

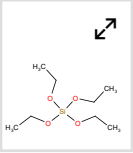
Topic: Trimethoxymethylsilane | Polycondensation | Siloxanes

Prominence percentile: 62.257

Chemistry database information

Substances





Author keywords

Metrics View all metrics >

10 Citations in Scopus
82nd percentile

1.62 Field-Weighted Citation Impact

PlumX Metrics
Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

Cited by 10 documents

Determination of water content in raw perlites: Combination of NIR spectroscopy and thermoanalytical methods
Pálková, H. , Kureková, V. , Madejová, J.
(2020) Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy

The effect of methyltriethoxysilane (MTES) concentration on hydrophobic properties of silica thin layer
Mustika, L.D. , Azmiyawati, C. , Darmawan, A.
(2020) AIP Conference Proceedings

The performance of membranes interlayer-free silica-pectin templated for seawater desalination via pervaporation operated at high temperature of feed solution
Elma, M. , Pratiwi, A.E. , Rahma, A.
(2020) Materials Science Forum

View all 10 citing documents

Inform me when this document is cited in Scopus:

ScienceDirect

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy

Supports *open access*

- View aims and scope
- Submit your article
- Guide for authors

Explore journal content

- Latest issue
- Articles in press
- Article collections
- All issues

- Sign in to set up alerts
- RSS | *open access* RSS

Articles

Articles in press Latest published Top cited Most popular

Recently viewed by you

Spectrochimica Acta Part A: Molecular and Biomolecular Spectrosc...

Supports *open access*

About the journal

Editors

Malgorzata Baranska
Jagiellonian University in Krakow, Krakow, Poland
Raman imaging and spectroscopy

Joel Bowman
Emory University, Atlanta, Georgia, United States
computational spectroscopy, potentials and molecular dynamics

Sylvio Canuto
University of Sao Paulo, São Paulo, Brazil
Computational modeling and simulation of molecular spectroscopy and reactivity

Christian W. Huck
Leopold-Franzens-Universität Innsbruck, Austria

Spectrochimica Acta Part A: Molecular and Biomolecular Spectrosc...

Supports *open access*

UV-Vis, IR and Raman molecular spectroscopies both in time and frequency domain

Managing Editors

Tanya Walker
Cappa South, Sixmilebridge, Clare, Ireland

Editorial Assistants

Assistant for M. Baranska: Katarzyna Majzner
Jagiellonian University in Krakow, Krakow, Poland

Assistant for S. Umapathy: Sanchita Sil
Indian Institute of Science, Bengaluru, India

Editorial Board

Vincenzo Barone
Pisa, Italy

Catherine Berthomieu
Marseille, France

Gary Blanchard
East Lansing, Michigan, United States

Hugh Byrne
Dublin, Ireland

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy
Supports *open access*

Guide for Authors

Menu

Search in this journal

Download PDF Article preview

Abstract Graphical abstract

Abstract

Curcumin isoxazole (CI) and Curcumin pyrazole (CP), the diketo modified derivatives of Curcumin (CU) are metabolically more stable and are being explored for pharmacological properties. One of the requirements in such activities is their interaction with circulatory proteins like human serum albumin (HSA). To understand this, the interactions of CI and CP with HSA have been investigated employing absorption and fluorescence spectroscopy and the results are compared with that of CU. The respective binding constants of CP, CI and CU with HSA were estimated to be 9.3×10^5, 8.4×10^5 and 2.5×10^5 M^{-1}, which decreased with increasing salt concentration in the medium. The extent of decrease in the binding constant was the highest in CP followed by CI and CU. This revealed that along with hydrophobic interaction other binding modes like electrostatic interactions operate between CP/CI/CU with HSA. Fluorescence quenching studies of HSA with these compounds suggested that both static and

Research article ● Full text access

Spectrophotometric, colorimetric and visually detection of *Pseudomonas aeruginosa* ETA gene based gold nanoparticles DNA probe and endonuclease enzyme

Bahram Amini, Mehdi Kamali, Mojtaba Salouti, Parichehreh Yaghmaei

Pages 421-429

Download PDF Article preview

Abstract Graphical abstract

Abstract

Colorimetric DNA detection is preferred over other methods for clinical molecular diagnosis because it does not require expensive equipment. In the present study, the colorimetric method based on gold nanoparticles (GNPs) and endonuclease enzyme was used for the detection of *P. aeruginosa ETA* gene. Firstly, the primers and probe for *P. aeruginosa* exotoxin A (ETA) gene were designed and checked for specificity by the PCR method. Then, GNPs were

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy
Supports *open access*

Hydrophobicity of silica thin films: The deconvolution and interpretation by Fourier-transform infrared spectroscopy

Riza Eka Saputra, Yayuk Astuti, Adi Darmawan

Pages 12-20

Abstract

This work investigated the synthesis of dimethoxydimethylsilane:tetraethoxysilane (DMDMS:TEOS) silica thin films as well as the effect of DMDMS:TEOS molar ratios and calcination temperature on hydrophobic properties of silica thin films and its correlation with the FTIR spectra behaviour. The silica thin films were synthesized by sol-gel method using combination of DMDMS and TEOS as silica precursors, ethanol as solvent and ammonia as catalyst, with DMDMS and TEOS molar ratio of 10:90, 25:75, 50:50, 75:25 and 90:10. The results showed that DMDMS:TEOS molar ratio had significant impact on the hydrophobic properties of silica thin films coated on a glass surface. Furthermore, the correlation between water contact angle (WCA) and DMDMS:TEOS molar ratio was found to be in a parabolic shape. Concurrently, the maximum apex of the parabola obtained was observed on the DMDMS:TEOS molar ratio of 50:50 for all calcination temperature. It was clearly observed that the silica xerogel exhibiting notable

Research article ● Full text access

Study on the prediction of soil heavy metal elements content based on visible near-infrared spectroscopy

Jinbao Liu, Yang Zhang, Huanyuan Wang, Yichun Du

Pages 43-49

Abstract

The estimation of soils heavy metal content can reflect the impending surroundings of surface, which lays theoretical foundation for using covered vegetation to monitor environment and investigate resource. In this study,

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy
Supports *open access*

Tm^{3+}-doped lead silicate glass sensitized by Er^{3+} for efficient ~2 μm mid-infrared laser material

Junjie Zhang, Ning Wang, Yanyan Guo, Muzhi Cai, ... Shiqing Xu

Pages 65-70

Download PDF Article preview

Abstract Graphical abstract

Abstract

Er^{3+}/Tm^{3+} co-doped lead silicate glasses with low phonon (953 cm^{-1}) and good thermal stability were synthesized. The ~2 μm mid-infrared emission resulting from the $^3F_4 \rightarrow {}^3H_6$ transition of Tm^{3+} sensitized by Er^{3+} has been observed by 808 nm LD pumping. The optimal luminescence intensity was obtained in the sample with $1Tm_2O_3/2.5Er_2O_3$ co-doped. Moreover, the energy transfer mechanism from Er^{3+} to Tm^{3+} ion was analyzed. Absorption and emission cross section have been calculated. The calculated maximum emission cross section of Tm^{3+} is 2.689×10^{-21} cm^2 at 1863 nm. Microparameters of energy transfer between Er^{3+} and Tm^{3+} ions have also been analyzed. These results ensure that the prepared Er^{3+}/Tm^{3+} co-doped lead silicate glasses have excellent spectroscopic properties in mid-infrared region and provide a beneficial guide for mid-infrared laser material.

Research article • Full text access

Underdetermined blind separation of three-way fluorescence spectra of PAHs in water

Ruifang Yang, Nanjing Zhao, Xue Xiao, Wei Zhu, ... Wenqing Liu

Pages 80-85

Download PDF Article preview

Abstract Graphical abstract

Abstract

In this work, underdetermined blind decomposition method is developed to recognize individual components from the three-way fluorescent spectra of their mixtures by using sparse component analysis (SCA). The mixing matrix is estimated from the mixtures using fuzzy data clustering algorithm together with the scatters corresponding to local

Outline Download Share Export

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy
Volume 199, 15 June 2018, Pages 421-429

Spectrophotometric, colorimetric and visually detection of *Pseudomonas aeruginosa* ETA gene based gold nanoparticles DNA probe and endonuclease enzyme

Bahram Amini [a], Mehdi Kamali [b], Mojtaba Salouti [c], Parichehreh Yaghmaei [a]

[a] Department of Biology, Science and Research Branch (IAU), Islamic Azad University, Tehran, Iran
[b] Nanobiotechnology Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran
[c] Department of Microbiology, Faculty of Sciences, Zanjan Branch, Islamic Azad University, Zanjan, Iran

Received 4 December 2017, Revised 16 March 2018, Accepted 23 March 2018, Available online 24 March 2018.

Check for updates

Show less

https://doi.org/10.1016/j.saa.2018.03.056

Get rights and content

Highlights

- The limit of detection (LOD), and limit of quantitation (LOQ) were determined.
- The sensitivity of nanomaterials system was determined at different concentration of the target DNA of *P. aeruginosa*.
- The colorimetric assay using restriction endonuclease was used for first report on *P. aeruginosa* gene detection.

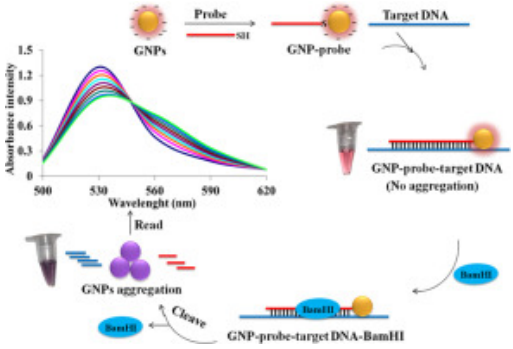
Abstract

Colorimetric DNA detection is preferred over other methods for clinical molecular diagnosis because it does not require expensive equipment. In the present study, the colorimetric method based on gold nanoparticles (GNPs) and endonuclease enzyme was used for the detection of *P. aeruginosa ETA* gene. Firstly, the primers and probe for *P.*

Outline Download Share Export

biosensor. Next, the extracted target DNA of the bacteria was added to GNP-probe complex to check its efficacy for *P. aeruginosa ETA* gene diagnosis. A decrease in absorbance was seen when GNP-probe-target DNA cleaved into the small fragments of *BamHI* endonuclease due to the weakened electrostatic interaction between GNPs and the shortened DNA. The right shift of the absorbance peak from 530 to 562 nm occurred after adding the endonuclease. It was measured using a UV-VIS absorption spectroscopy that indicates the existence of the *P. aeruginosa* ETA gene. Sensitivity was determined in the presence of different concentrations of target DNA of *P. aeruginosa*. The results obtained from the optimized conditions showed that the absorbance value has linear correlation with concentration of target DNA (R: 0.9850) in the range of 10–50 ng mL^{-1} with the limit detection of 9.899 ng mL^{-1}. Thus, the specificity of the new method for detection of *P. aeruginosa* was established in comparison with other bacteria. Additionally, the designed assay was quantitatively applied to detect the *P. aeruginosa ETA* gene from 10^3 to 10^8 CFU mL^{-1} in real samples with a detection limit of 320 CFU mL^{-1}.

Graphical Abstract



Download : Download high-res image (77KB) Download : Download full-size image

Previous Next

Abbreviations

GNPs, gold nanoparticles; DTT, dithiothreitol; ETA, exotoxin A; LB-broth, Luria-bertani broth; TEM, Transmission electron microscopy; DLS, dynamic light scattering

Keywords

Pseudomonas aeruginosa; Colorimetric assay; *ETA gene*; Gold nanoparticles; Endonuclease

1. Introduction

Pseudomonas aeruginosa is an opportunistic microorganism which can cause fatal infections in a wide range of immunocompromised diseases, such as cancer, cystic fibrosis (CF), and burns [1]. This bacterium has a variety of virulence factors, such as different types of proteases, exotoxins, polysaccharides, and flagella [1,2]. *P. aeruginosa* is

Outline Download Share Export

[3] D.K. Mendiratta, V. Deotale, P. Narang
Metallo-beta-lactamase producing *Pseudomonas aeruginosa* in a hospital from a rural area
Indian J. Med. Res., 121 (2005), pp. 701-703
View Record in Scopus Google Scholar

[4] A. Adawi, L.F. Neville
Colony to colorimetry in 6 h: ELISA detection of a surface-expressed *Pseudomonas aeruginosa* virulence factor using immobilized bacteria
Diagn. Microbiol. Infect. Dis., 74 (2012), pp. 84-87
Article Download PDF View Record in Scopus Google Scholar

[5] V. Krishna, P.C. Jugun
Silver nanoparticles ensemble with Zn (II) complex of terpyridine as a highly sensitive colorimetric assay for the detection of arginine
Biosens. Bioelectron., 87 (2017), pp. 271-277
CrossRef Google Scholar

[6] C. Rui, H. Xiaolin, L. Juan, S. Shan, L. Weihua, X. Yonghua
A novel fluorescence immunoassay for the sensitive detection of Escherichia coli O157:H7 in milk based on catalase-mediated fluorescence quenching of CdTe quantum dots
Anal. Chim. Acta, 947 (2016), pp. 50-57
Google Scholar

[7] S.C. Wai, S.F. Bone, M.V. Tang, C.C. Boost, H.M. Polly
Detection of methicillin-resistant *Staphylococcus aureus* using a gold nanoparticle-based colorimetric polymerase chain reaction assay
Biosens. Bioelectron., 53 (2014), pp. 105-111
Google Scholar

[8] D. Jing, J. Yan, W. Lin, C. Guozhen, Z. Chengxiao
Sensitive detection of endonuclease activity and inhibition using gold nanorods
Biosens. Bioelectron., 34 (2012), pp. 144-150
View Record in Scopus Google Scholar

[9] B.M. Venkatesan, R. Bashir
Nanopore sensors for nucleic acid analysis
Nanotechnology, 6 (2011), pp. 615-624
CrossRef View Record in Scopus Google Scholar

[10] Z. Heidari, M. Salouti, R. Sariri
Breast cancer photo thermal therapy based on gold nanorods targeted by covalently coupled bombesin peptide
Nanotechnology, 26 (2015), p. 195101
CrossRef Google Scholar

[11] Z. Bingjie, C. Xiaomei, W. Haiping, S. Qinxin, W. Jianping, K. Tomoharu, K. Hideki, Z. Guohua

ScienceDirect

Outline Download Share Export

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy
Volume 199, 15 June 2018, Pages 228-234

Broadening emission band of $Ba_2B_2O_5$: Dy^{3+} by codoping Ce^{3+} as sensitizer and its application to white LEDs

Shuchao Xu, Zhijun Wang, Panlai Li, Ting Li, Qiongyu Bai, Zhiping Yang

Hebei Key Lab of Optic-electronic Information and Materials, College of Physics Science & Technology, Hebei University, Baoding 071002, China

Received 12 August 2017, Revised 25 March 2018, Accepted 26 March 2018, Available online 27 March 2018.

Check for updates

Show less

https://doi.org/10.1016/j.saa.2018.03.072

Get rights and content

Highlights

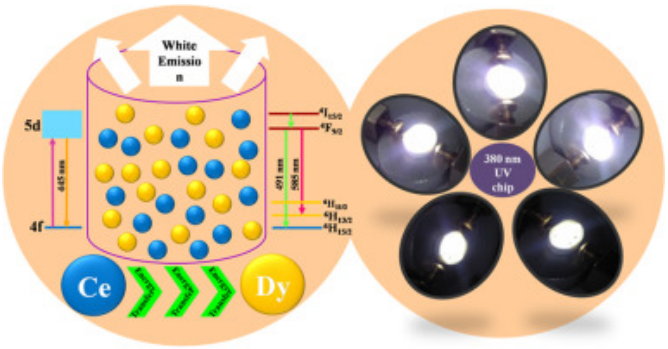
- A broadening emission phosphor $Ba_2B_2O_5$: Dy^{3+} was achieved by solid-state method.
- $Ba_2B_2O_5$:0,04Ce^{3+}, $y$$Dy^{3+}$ can emit white light by energy transfer.
- Emission spectra of Ce^{3+} have a blue-shift in temperature-dependent property.

Abstract

In order to achieve broad-band white emitting phosphor, Ce^{3+}/Dy^{3+} codoped $Ba_2B_2O_5$ were synthesized by a solid-state method, and the luminescence property and energy transfer were discussed in detail. Dy^{3+} doped $Ba_2B_2O_5$ shows white emission, and the two narrow peaks which are assigned to the $^4F_{9/2} \rightarrow {}^6H_{15/2}$ and $^4F_{9/2} \rightarrow {}^6H_{13/2}$ transitions of Dy^{3+} ions, respectively. When codoped Ce^{3+} as sensitizer, the broad-band white emission can be obtained by the energy transfer from Ce^{3+} to Dy^{3+} ions in $Ba_2B_2O_5$, and the mechanism is the dipole-dipole interaction. And the CIE coordinates can be tuned from (0.2501, 0.2323) to (0.3422, 0.3799) by increase Dy^{3+} content. The emission peak blue-shift of Ce^{3+} ions in $Ba_2B_2O_5$:Ce^{3+}, Dy^{3+} was observed from the thermal spectra, and the

mechanism was analyzed. A white light emitting diodes (LEDs) can be fabricated $Ba_2B_2O_5$:Ce^{3+}, Dy^{3+} with 380 nm chip, and the results show that the phosphor may be a potential application in this field.

Graphical Abstract



Download : Download high-res image (136KB) Download : Download full-size image

Previous Next

Keywords

Luminescence; Phosphors

1. Introduction

In the past years, phosphor-converted white light emitting diodes (LEDs) have much attention because of their advantage characteristic, and one of the key factors affecting performance is the phosphor which has attracted the interest of researcher [[1], [2], [3]]. Traditional white LEDs were fabricated YAG:Ce^{3+} with blue-chip which exhibit high correlated color temperature (CCT ≈ 7750 K) and poor color rendering index (CRI ≈ 70–80) [4,5]. Therefore, in order to achieve high performance white LEDs, some other methods are introduced. For example, it can be coupled ultraviolet (UV) or near UV chip with tri-color phosphors. Moreover, in order to avoid the re-absorption and control ratio of the tri-color phosphors, it can be replaced by the single phase white emitting phosphors [6]. Generally, Dy^{3+} doped phosphor can show the white emission characteristics which are associated to the blue and yellow emission peaks corresponding to the $^4F_{9/2} \rightarrow {}^6H_{15/2}$ and $^4F_{9/2} \rightarrow {}^6H_{13/2}$ transitions of Dy^{3+} ions, respectively [[7], [8], [9]]. However, the narrow peaks should lead to the non-full color. Therefore, in order to broaden the emission band, other activator ions should be introduced into the phosphor [10,11]. The emission band of Ce^{3+} ions doped phosphors can range from near-UV to orange red region, and the Ce^{3+} ions can enhance the emission intensity of other activator ions, such as Dy^{3+}, Eu^{3+} and Tb^{3+} ions [12]. Another key factor as luminescent material, it is important to choose the host compound [13]. Because borates show low synthetic temperature and high thermal/chemical stability, therefore, they attracted the attention of researchers. In this work, the single phase white emitting phosphor $Ba_2B_2O_5$:Dy^{3+} was synthesized, and its narrow emission band became broad by doping Ce^{3+} as sensitizer, and the luminescence properties and energy transfer of Ce^{3+} and Dy^{3+} in $Ba_2B_2O_5$ were investigated. The result may be useful to the development of white LEDs.

Dy^{3+} shows a good thermostability with a blue-shift of Ce^{3+} emission in the temperature-dependent emission. Moreover, the white LEDs are fabricated by BBO:Ce^{3+}, Dy^{3+} coating near-UV-LED chips. The results suggest that BBO:Ce, Dy may be potentially applied in UV-pumped white-LEDs.

Acknowledgements

The work is supported by the National Natural Science Foundation of China under Grant Nos. 50902042, 51672066; the Funds for Distinguished Young Scientists of Hebei Province, China under Grant No. A2015201129; the Natural Science Foundation of Hebei Province, China under Grant Nos. A2014201035, E2014201037; the Education Office Research Foundation of Hebei Province, China under Grant Nos. ZD2014036, QN2014085; China Postdoctoral Science Foundation funded project under Grant No.2015 M581311; the personnel training project of Hebei Province, China under Grant No. A2016002013 and the Midwest Universities Comprehensive Strength Promotion Project.

Recommended articles Citing articles (7)

References

[1] N. Pradal, G. Chadeyron, A. Potdevin, J. Des Mahiou, R. Mahiou
Elaboration and optimization of Ce-doped $Y_3Al_5O_{12}$ nanopowder dispersions
J. Eur. Ceram. Soc., 33 (10) (2013), pp. 1935-1945
Article Download PDF View Record in Scopus Google Scholar

[2] H.A. Hoppe
Recent developments in the field of inorganic phosphors
Angew. Chem. Int. Ed. Eng., 48 (20) (2009), pp. 3572-3582
CrossRef View Record in Scopus Google Scholar

[3] C. Feldmann, T. Jüstel, C.R. Ronda, P.J. Schmidt
Inorganic luminescent materials: 100 years of research and application
Adv. Funct. Mater., 13 (7) (2003), pp. 511-516
CrossRef View Record in Scopus Google Scholar

[4] R.J. Xie, N. Hirosaki, T. Suehiro, F. F
Xu and M. Mitomo. A simple, efficient synthetic route to $Sr_2Si_5N_8$:Eu^{2+} -based red phosphors for white light-emitting diodes
Chem. Mater., 38 (4) (2006), pp. 5578-5583
CrossRef View Record in Scopus Google Scholar

[5] C. Feldmann, T. Jüstel, C.R. Ronda, P.J. Schmidt
Inorganic luminescent materials: 100 years of research and application
Adv. Funct. Mater., 13 (7) (2003), pp. 511-516
CrossRef View Record in Scopus Google Scholar

[6] K. Li, M.M. Shang, D.L. Geng, H.Z. Lian, Y. Zhang, J. Fan, J. Lin
Synthesis, luminescence, and energy-transfer properties of β-$Na_2Ca_4(PO_4)_2(SiO_4)$:A (A = Eu^{2+}, Dy^{3+}, Ce^{3+}/Tb^{3+}) phosphors
Inorg. Chem., 53 (13) (2014), pp. 6743-6751
CrossRef View Record in Scopus Google Scholar

Download Share Export

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy
Volume 199, 15 June 2018, Pages 50-56

Chelation of heavy group 2 (radio)metals by *p-tert*-butylcalix[4]arene-1,3-crown-6 and logK determination *via* NMR

David Bauer [a, b], Matthew Gott [a], Jörg Steinbach [a, b], Constantin Mamat [a, b]

[a] Helmholtz-Zentrum Dresden-Rossendorf, Institut für Radiopharmazeutische Krebsforschung, Bautzner Landstraße 400, D-01328 Dresden, Germany
[b] Technische Universität Dresden, Fakultät Chemie und Lebensmittelchemie, D-01062 Dresden, Germany

Received 12 December 2017, Revised 9 February 2018, Accepted 12 March 2018, Available online 13 March 2018.

Check for updates

Show less

https://doi.org/10.1016/j.saa.2018.03.029

Get rights and content

Highlights

- Synthesis of M^{2+}-complexes consisting of the calix[4]crown-6-ligand and heavy alkaline earth metal ions
- Determination of stability constants for the complex formation by ^{1}H NMR titration
- Application of ^{207}Pb NMR to support the complex behavior and structural findings

Abstract

A crown-bridged calix[4]arene scaffold was investigated as lead compound for the ligation of heavy alkaline earth metals such as strontium and barium, which appear to be useful for radiopharmaceutical applications in diagnosis as well as in radiotherapy. In particular barium, due to its chemical similarities, could serve as a surrogate for radium, a metal of high radiopharmaceutical interest. The ability of *p-tert*-butylcalix[4]arene-1,3-crown-6 (**1**) in particular to chelate cations, such as group 1 and 2 metal ions or ammonium ions is well known. Also, the manifold possibilities of structural modification on the upper- and lower-rim as well as on the crown itself produce properties that may lead to a highly selective and effective chelating agent. In this work, titration experiments of the perchlorate salts of Ba^{2+}, Sr^{2+} and Pb^{2+} with ligand **1** were performed to determine their stability constants (logK = 4.7, 4.3, and 3.3, respectively) by ^{1}H NMR measurements in acetonitrile-d_3.

Download Share Export

The radiochemical and radiopharmaceutical applications of radium
Open Chem., 14 (2016), pp. 118-129
CrossRef View Record in Scopus Google Scholar

[4] E.J. Hall, A.J. Giaccia
Radiobiology for the Radiologist
(6th ed.), Lippincott Williams & Wilkins, Philadelphia (2006)
Google Scholar

[5] K.D. Mjos, C. Orvig
Metallodrugs in medicinal inorganic chemistry
Chem. Rev., 114 (2014), pp. 4540-4563
CrossRef View Record in Scopus Google Scholar

[6] R.P. Spencer, R.C. Lange, S. Treves
Use of Ba-135m and Ba-131 as bone-scanning agents
J. Nucl. Med., 12 (1971), pp. 216-227
View Record in Scopus Google Scholar

[7] A. Sonzogni
Inteactive Chart of Nuclides
http://www.nndc.bnl.gov/chart/
(accesed: 30.10.2017)
Google Scholar

[8] F. Hosain, I.B. Syed, H.N. Wagner Jr., J.K. Poggenburg
Ionic barium 135 m: a new agent for bone scanning
Radiology, 98 (1971), pp. 684-686
CrossRef View Record in Scopus Google Scholar

[9] J.H. Kearsley, R.S. Fitchew, R.G. Taylor
Adjunctive radiotherapy with strontium-90 in the treatment of conjunctival squamous cell carcinoma
Int. J. Radiat. Oncol. Biol. Phys., 14 (1988), pp. 435-443
Article Download PDF View Record in Scopus Google Scholar

[10] S. Laskar, L. Gurram, S.G. Laskar, S. Chaudhari, N. Khanna, R. Upreti
Superficial ocular malignancies treated with strontium-90 brachytherapy: long term outcomes
J. Contemp. Brachyther., 7 (2015), pp. 369-373
CrossRef View Record in Scopus Google Scholar

[11] C.D. Gutsche
Calixarenes: An Introduction
(2nd ed.), The Royal Society of Chemistry (2008)
Google Scholar

[12] G. McMahon, S. O'Malley, K. Nolan, D. Diamond
Important calixarene derivatives - their synthesis and applications
ARKIVOC (2003), pp. 23-31
CrossRef View Record in Scopus Google Scholar

[13] M. Deska, B. Dondela, W. Sliwa
Selected applications of calixarene derivatives

ScienceDirect

Download Share Export

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy
Volume 199, 15 June 2018, Pages 57-64

Surface speciation of phosphate on goethite as seen by InfraRed Surface Titrations (IRST)

Jeison Manuel Arroyave, Virginia Puccia, Graciela P. Zanini, Marcelo J. Avena

INQUISUR, Departamento de Química, Universidad Nacional del Sur (UNS)-CONICET, Av. Alem 1253, 8000 Bahía Blanca, Argentina

Received 29 November 2017, Revised 6 March 2018, Accepted 12 March 2018, Available online 14 March 2018.

Check for updates

Show less

https://doi.org/10.1016/j.saa.2018.03.043

Get rights and content

Highlights

- Infrared Surface Titrations can easily detect adsorbed phosphate species.
- Two monodentate phosphate complexes populate the surface of goethite.
- The fraction of species changes with pH and surface coverage.

Abstract

Phosphate adsorption at the metal oxide-water interface has been intensely studied, and the system phosphate-goethite in aqueous media is normally used as a model system with abundant information regarding adsorption-desorption under very different conditions. In spite of this, there is still discussion on whether the main inner-sphere surface complexes that phosphate forms on goethite are monodentate or bidentate. A new spectroscopic technique, InfraRed Surface Titration (IRST), is presented here and used to systematically explore the surface speciation of phosphate on goethite in the pH range 4.5–9.5 at different surface coverages. IRST enabled to construct distribution curves of surface species and distribution curves of dissolved phosphate species. In combination with the CD-MUSIC surface complexation model it was possible to conclude that surface complexes are monodentate. Very accurate distribution curves were obtained, showing a crossing point at pH 5.5 at a surface coverage of 2.0 μmol m^{-2}, with a mononuclear monoprotonated species predominating at pH > 5.5 and a mononuclear diprotonated species prevailing at pH < 5.5. On the contrary, at the low surface coverage of 0.7 μmol m^{-2} there is no crossing point, with the mononuclear monoprotonated species prevailing at all pH. IRST

Acknowledgments

CONICET, FONCyT and UNS are acknowledged for financial support. J. Manuel Arroyave thanks FONCyT and CONICET for doctoral fellowships.

Appendix A. Supplementary data

Download : **Download Word document (156KB)**

Supplementary material

Recommended articles Citing articles (11)

References

[1] Donald L. Sparks
Environmental soil chemistry
Soil Sci., 162 (2002), pp. 229-231
Google Scholar

[2] H. Wang, J. Zhu, Q. Fu, C. Hong, H. Hu, A. Violante
Phosphate adsorption on uncoated and humic acid-coated iron oxides
J. Soils Sediments, 16 (7) (2016), pp. 1911-1920
CrossRef View Record in Scopus Google Scholar

[3] Y. Yang, S. Wang, Y. Xu, B. Zheng, J. Liu
Molecular-scale study of aspartate adsorption on goethite and competition with phosphate
Environ. Sci. Technol., 50 (6) (2016), pp. 2938-2945
CrossRef View Record in Scopus Google Scholar

[4] J.S. Geelhoed, T. Hiemstra, W.H. Van Riemsdijk
Phosphate and sulfate adsorption on goethite: single anion and competitive adsorption
Geochim. Cosmochim. Acta, 61 (12) (1997), pp. 2389-2396
Article Download PDF View Record in Scopus Google Scholar

[5] R. Rahnemaie, T. Hiemstra, W.H. Van Riemsdijk
Geometry, charge distribution, and surface speciation of phosphate on goethite
Langmuir, 23 (7) (2007), pp. 3680-3689
CrossRef View Record in Scopus Google Scholar

[6] M.I. Tejedor-Tejedor, M.A. Anderson
Protonation of phosphate on the surface of goethite as studied by CIR-FTIR and electrophoretic mobility
Langmuir, 6 (3) (1990), pp. 602-611
CrossRef View Record in Scopus Google Scholar

[7] P. Persson, N. Nilsson, S. Sjöberg
Structure and bonding of orthophosphate ions at the Iron oxide-aqueous Interface
J. Colloid Interface Sci., 177 (1) (1996), pp. 263-275
(Internet)
Article Download PDF View Record in Scopus Google Scholar

[8] W. Salama, M. El Aref, R. Gaupp