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

Judul Jurnal Ilmiah (Artikel)	:	Cerium oxide nanoparticles application for rapid adsorptive removal of tetracycline in water		
Nama/ Jumlah Penulis	:	4 Orang		
Status Pengusul	:	penulis ke-1		
Identitas Jurnal Ilmiah	:	a. Nama Jurnal	:	Journal of Environmental Chemical Engineering
		b. Nomor ISSN	:	2213-3437
		c. Vol, No., Bln Thn	:	Vol 8,No 1, Februari 2020
		d. Penerbit	:	Elsevier Ltd
		e. DOI artikel (jika ada)	:	10.1016/j.jece.2019.103613
		f. Alamat web jurnal	:	https://www.sciencedirect.com/journal/journal-of-environmental-chemical-engineering
		Alamat Artikel	:	https://www.sciencedirect.com/science/article/pii/S2213343719307365?via%3Dihub
		g. Terindex	:	Scopus(Scimagojr, Q1 SJR = 0.93 H-index = 60) dan Web of Science (Science Citation Index Expanded)

Kategori Publikasi Jurnal Ilmiah (beri ✓pada kategori yang tepat)	:	√	~~Jurnal Ilmiah Internasional~~/Internasional Bereputasi
			Jurnal Ilmiah Nasional Terakreditasi
			Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi jurnal (10%)	4	4	4
b. Ruang lingkup dan kedalaman pembahasan (30%)	12	12	12
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12	11	11,5
d. Kelengkapan unsur dan kualitas penerbit (30%)	11	11	11
Total = (100%)			38,5
Nilai untuk Pengusul : 60% x 38,5 = 23,1			

Semarang, 17 Januari 2022

Reviewer 1

Prof. Dr. Heri Sutanto, S.Si., M.Si.
NIP. 197502151998021001
Unit Kerja : Universitas Diponegoro
Bidang Ilmu: Fisika Material

Reviewer 2

Prof. Dr. Kusworo Adi, M.T.
NIP. 197203171998021001
Unit Kerja : Universitas Diponegoro
Bidang Ilmu: Fisika Instrumentasi

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- [ ] Jurnal Ilmiah Nasional Terakreditasi
- [ ] Jurnal Ilmiah Nasional Tidak Terakreditasi

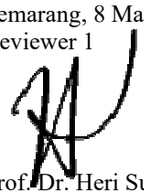
Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
	Internasional [40]	Nasional Terakreditasi [ ]	Nasional Tidak Terakreditasi [ ]	
a. Kelengkapan unsur isi jurnal (10%)	4			4
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 terbitan/jurnal (30%)	12			11
Total = (100%)	**40**			**39**
Nilai Pengusul = (40% x 39)/3 = 5,2				

Catatan Penilaian artikel oleh Reviewer :

1. **Kesesuaian dan kelengkapan unsur isi jurnal:**
   Artikel disusun sudah sesuai dengan of Author Guidence pada Journal of Environmental Chemical Engineering (Introduction, Materials and methods, Results and discussion, Conclusion, Author contributions, Declaration of Competing Interest, Acknowledgments, References). Substansi dari artikel yang ditulis sesuai dengan bidang ilmu penulis yaitu fisika material. Pada struktur penulisan ada keterkaitan antar bagian.
2. **Ruang lingkup dan kedalaman pembahasan:**
   Isi artikel sudah sesuai dengan ruang lingkup jurnal yaitu pada kajian physico-chemical processes, AOP, Biological processes dan nanomaterials for environmental and chemical applications. Pembahasan telah dilakukan sangat baik dan komprehensif serta sudah membandingkan dengan hasil peneliti (dibuktikan pada referensi 19 dari 41).
3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:**
   Hasil penelitian mempunyai kontribusi siginifikan pada bidang material yang disertai metodologi yang baik untuk mencapai hasil yang diharapkan. Referensi total 41 buah dan kategori mutakhir (dibawah 10 tahun) serta relevan dengan artikel yang dibahas.
4. **Kelengkapan unsur dan kualitas terbitan:**
   Jurnal tersebut termasuk dalam kategori Jurnal Internasional Bereputasi terindeks Scopus Q1 dengan SJR 0.93 (2019). Editorial board jurnal terdiri lebih dari empat negara dan kontributor lebih dari 4 negara, ISSN 2213-3437, dan proses review jurnal dilakukan dengan bagus.

Semarang, 8 Maret 2021
Reviewer 1



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NIP. 197203171998021001
Unit Kerja : Universitas Diponegoro
Bidang Ilmu: Fisika Material

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		g. Terindex	:	Scopus(Scimagojr, Q1 SJR = 0.93 H-index = 60) dan Web of Science (Science Citation Index Expanded)

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- [ ] Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
	Internasional [40]	Nasional Terakreditasi [ ]	Nasional Tidak Terakreditasi [ ]	
a. Kelengkapan unsur isi jurnal (10%)	4			4
b. Ruang lingkup dan kedalaman pembahasan (30%)	12			12
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12			11
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			11
Total = (100%)	**40**			**38**
Nilai Pengusul = (40% x 38)/3 = 5,06				

Catatan Penilaian artikel oleh Reviewer :

1. **<u>Kesesuaian dan kelengkapan unsur isi jurnal:</u>**
   Kesesuaian dan kelengkapan unsur jurnal sudah sesuai Guide of Author pada Journal of Environmental Chemical Engineering (Introduction, Materials and methods, Results and discussion, Conclusion, Author contributions, Declaration of Competing Interest, Acknowledgments, References). Substansi publikasi sesuai dengan bidang ilmu penulis yaitu fisika material. Pada struktur penulisan ada keterkaitan antar bagian (skor=4,00).
2. **<u>Ruang lingkup dan kedalaman pembahasan:</u>**
   Makalah sudah sesuai dengan ruang lingkup jurnal yaitu Physico-chemical processes, Advanced oxidation processes, Nanomaterials for environmental and chemical applications, dan Biological processes. Pembahsaan sangat komprehensif yang membandingkan dengan penelitian lain (19 dari 41 referensi) sehingga pembahasan dilakukan dengan sangat baik (skor=12,00).
3. **<u>Kecukupan dan kemutakhiran data/informasi dan metodologi:</u>**
   Hasil penelitian cukup memberikan informasi pada bidang material yang disertai metodologi yang cukup baik untuk mencapai hasil yang diharapkan. Referensi sejumlah 41 semuanya dibawah 10 tahun dan medukung topik yang dibahas (skor = 11)
4. **<u>Kelengkapan unsur dan kualitas terbitan:</u>**
   Jurnal tersebut termasuk dalam kategori Jurnal Internasional Bereputasi dengan editorial board lebih dari empat negara dan kontributor lebih dari 4 negara, ISSN 2213-3437, terindeks scopus dengan SJR=0,927 (2019)/Q1 dan proses review jurnal cukup bagus (skor=11,00).

Semarang, 7 Oktober 2020
Reviewer 2

Dr. Kusworo Adi, M.T.
NIP. 197203171998021001
Unit Kerja : Universitas Diponegoro
Bidang Ilmu: Fisika Instrumentasi

Document details

Journal of Environmental Chemical Engineering
Volume 8, Issue 1, February 2020, Article number 103613

Cerium oxide nanoparticles application for rapid adsorptive removal of tetracycline in water (Article) (Open Access)

Nurhasanah, I., Kadarisman, Gunawan, V., Sutanto, H.

Department of Physics, Faculty of Science and Mathematics, Universitas Diponegoro, Jalan Prof. Soedarto, S.H., Tembalang, Semarang, Central Java, 50275, Indonesia

Abstract

View references (41)

This study investigates the potential of CeO_2 nanoparticle as an adsorbent to remove tetracycline (TC) in water. CeO_2 nanoparticle was synthesized using precipitation method in water/alcohol mixed solvents. As-synthesized sample was characterized using x-ray diffractometer, scanning electron microscope, and Fourier transform infrared spectroscopy. The adsorption isotherm experiment was conducted in liquid phase by varying the contact time and the temperature at initial TC concentration of 25-125 mg/L. The result showed that CeO_2 has a cubic structure with crystallite size of 10.86 nm and is composed by aggregate particles. The equilibrium adsorption is reached after a contact time of 60 min that yield the removal efficiency of 80-97% and adsorption capacity of 58.03 mg/g. The adsorption kinetic analysis indicated that the adsorption process could be described by a pseudo second order model . The thermodynamic parameters confirmed that TC adsorption onto CeO_2 nanoparticle was exothermic and spontaneous. The high removal efficiency and short time adsorption equilibrium suggest that CeO_2 nanoparticle can be used as an antibiotic adsorbent for water treatment. © 2019 Elsevier Ltd.

SciVal Topic Prominence

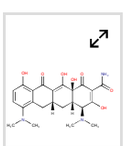
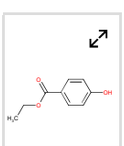
Topic: Sulfadimidine | Oxytetracycline | Sulfamethoxazole

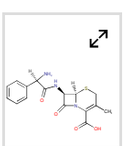
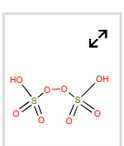
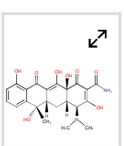
Prominence percentile: 99.873

Chemistry database information

Substances

View all substances (8)

Author keywords

Adsorption | CeO_2 | Tetracycline | Water treatment

Indexed keywords

Engineering controlled terms: Adsorption | Adsorption isotherms | Crystallite size | Efficiency | Fourier transform infrared spectroscopy | Nanoparticles | Particle size analysis | Precipitation (chemical) | Scanning electron microscopy | Synthesis (chemical) | Water treatment

Engineering uncontrolled terms: Adsorption capacities | CeO2 | Cerium oxide nanoparticle | Equilibrium adsorption | Precipitation methods | Pseudo-second order model | Tetracycline | Thermodynamic parameter

Engineering main heading: Cerium oxide

Funding details

Funding sponsor	Funding number	Acronym
	125/SP2H/ PTNBH/DRPM/2019	

Funding text

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Document Type: Article
Publisher: Elsevier Ltd

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New synthesis route of Cu-CuO-Ni nano-heterostructures for hydrogenation and chromium reduction reactions

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ABSTRACT

A simple one-pot aqueous phase chemical reduction has been used for the successful synthesis of flower-like Cu-CuO-Ni heterostructures. X-ray diffraction analysis and X-ray photoelectron spectroscopy confirms the presence of metallic copper, nickel and monoclinic copper oxide (CuO) in the sample with traces of $Cu(OH)_2$. Scanning electron microscope images confirms the flower like morphology of the Cu-CuO-Ni nanoheterostructures. For the first time, Cu-CuO-Ni nanocrystals were employed as a new heterogeneous efficient nanocatalyst for the hydrogenation reduction of 4-nitrophenol (4-NP) and reduction of chromium (VI) (Cr) to chromium (III). The synthesized Cu-CuO-Ni nanocrystals showed highest catalytic properties with an activity factor of 0.0088 $s^{-1}\,mg^{-1}$for reduction of 4-nitrophenol and 0.057 $min^{-1}$for chromium reduction reaction. The XRD and XPS analysis of the catalytically recycled samples suggests the higher catalytic stability of Cu-CuO-Ni nanocrystals. In comparison to the bare CuO and CuO- Ni nanocrystals the maximum catalytic activity was shown by Cu-CuO-Ni nanocrystals. The improved catalytic activity was found to be due to the combined effect of morphological and compositional differences. The commendable catalytic efficiency along with the facile synthetic approach and the use of low-cost copper and nickel significantly reduces the cost of the catalytic process. The stability of the Cu-CuO-Ni catalyst system for the chromium reduction reactions was monitored by conducting recyclability test for three times. Therefore, the developed Cu-CuO-Ni nanocatalyst offers significant applications in waste water treatment systems and other industrial applications.

1. Introduction

One of the important characteristics of heterostructured nanocrystals is their composition dependent surface structure as well as atomic segregation properties. These properties make heterostructured nanocrystals potential candidates for using as effective catalysts with highly improved activity and stability [1].Various methods adopted, for the synthesis of heterostructurednanocrystals with tunable chemical composition, structure as well as shape, includereduction in hot surfactant solutions [2], micelle [3] and dendrimertemplating [4]. In the area of catalysis copper nanoparticles show considerable attention in many of the reactions including oxidation of alcohols, carbon-heteroatom bond formation, oxidation of carbon monoxide etc [5]. Nanostructured Cu [6], Cu_2O [7] and CuO [8] were reported to be excellent catalyst compared to noble metals and received great attention owed to their low cost and easy availability. Among the copper based nanostructures, copper oxide(CuO) is a narrow band gap *p*-type semiconductor exhibiting unique properties different from those of bulk materials, which has found applications in various fields of electronics, optics and solar cells [9]. The major disadvantages of mere CuO nanocrystals are decreased stability and higher tendency for self-aggregation due to their enormous surface area and surface energy. Such agglomeration of particles will usually result in decreased catalytic efficiency of CuO nanoparticles due to the decreased surface area. The general methods to solve these problems are loading CuO in different supporting materials [10] or modifying CuO into various shapes like urchins [11]. The selection of method adopted for achieving the stability and preventing agglomeration has significant role in sustaining the catalytic efficiency

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Mechanisms of 4-phenylazophenol elimination in micro- and nano-ZVI assisted-Fenton systems

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ABSTRACT

The 4-phenylazophenol (4-PAP), was treated with two different sources of metallic iron (ZVI): commercial micrometric powder (pZVI) and nanoparticles synthetized by the borohydride reduction method (nZVI). 4-PAP degradation was studied both in the absence and in the presence of H_2O_2 at different pHs. The degradation products of 4-PAP in each treatment were followed by LC-MS and CG-MS. Results showed that, in the absence of H_2O_2, the azo bond reduction of 4-PAP with the formation of amines was the main mechanism involved for both ZVI sources and nZVI exhibited a faster substrate removal than pZVI. In the presence of H_2O_2, an additional mechanism involving the oxidation mediated by hydroxyl radicals takes place. For pZVI, the addition of H_2O_2 produced a complete inhibition of the reduction pathway, being the oxidation the main degradation mechanism. In the case of nZVI, the system behavior showed an important dependence on the working pH. At pH 3.00, oxidative transformation pathways prevailed, whereas at pH 5.00 an almost negligible degradation -mainly driven by 4-PAP reduction- was observed. The assessment of the involved reaction mechanisms under different conditions allows the selection of the most suitable source for a specific treatment.

1. Introduction

Fenton related techniques are one of the most studied wastewater treatments due to their ability to oxidize a wide variety of pollutants using green reactants with few environmental impacts [1]. Several works have focused on its use for the degradation of azo dyes [2–4], the most common family of dyes used in textile industry [5]. These dyes are resistant to traditional biological treatments and can generate carcinogenic aromatic amines upon reduction [6]. In particular, it has been shown that the dye 4-phenylazophenol (4-PAP), also known as Solvent Yellow 7, may be easily absorbed by human skin and metabolized to the mutagenic aniline [7]. 4-PAP has one of the simplest structures among azo dyes, consisting on a benzene and a phenol ring conjugated through an azo linkage (Fig. S1). This is an advantage for identification of products obtained under different conditions.

Fenton related techniques are based on the production of hydroxyl radicals ($OH^{\cdot}$) from Fe(II) and H_2O_2 [8].

$$Fe(II) + H_2O_2 \rightarrow [Fe(III)OH]^{2+} + HO^{\cdot} \quad (1)$$

Hydroxyl radicals have a high oxidation potential [9] and are capable of oxidize most of the organic compounds present in industrial effluents. The oxidation of aromatic compounds usually involves the addition of a hydroxyl group (-OH) to the aromatic ring during the first oxidation steps generating hydroxylated derivatives [10]. A subsequent attack of hydroxyl radical produces dihydroxylated compounds. Although a third addition is possible, trihydroxylated compounds are unstable and tend to undergo ring opening reactions with the loss of aromaticity and the generation of aliphatic acids [11]. In the case of azo dyes, $OH^{\cdot}$ can also attack azo bonds thus generating hydroxylamines (R-NHOH), hydroxyl hydrazines (R-NH-NHOH), nitroso compounds (R-

Abbreviations: ZVI, zero valent iron; pZVI, ZVI powder; nZVI, ZVI nanoparticles; 4-PAP, 4-phenylazophenol; MOH-, monohydroxylated; DOH-, dehydroxylated; DMSO, Dimethyl sulfoxide; LC-MS, liquid chromatography with mass detector; CG-MS, gas chromatography with mass detector

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