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

Judul Jurnal Ilmiah (Artikel) : Preparation of Magnetite-Silica–Cetyltrimethylammonium for Phenol Removal Based on Adsolubilization

Jumlah Penulis : 5 orang

Status Pengusul : penulis ke-3

Identitas Jurnal Ilmiah : a. Nama Jurnal : Open Chemistry
 b. Nomor ISSN : Online ISSN: 2391-542, Print ISSN: 1644-3624
 c. Vol, No., Bln Thn : Vol. 18, No. 1, April 2020
 d. Penerbit : Walter de Gruyter GmbH
 e. DOI artikel (jika ada) : 10.1515/chem-2020-0040
 f. Alamat web jurnal : <https://www.degruyter.com/view/journals/chem/18/1/chem.18.issue-1.xml>
 Alamat Artikel : <https://www.degruyter.com/view/journals/chem/18/1/article-p369.xml>
 g. Terindex : Scopus/Scimagojr/SJR=0,3 dan Q3

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- Kesesuaian dan kelengkapan unsur isi jurnal:** Penulis memaparkan isi artikel secara keseluruhan, terdiri dari pendahuluan, metodologi, hasil dan pembahasan, kesimpulan dan referensi, secara logis dan konsisten sesuai kaidah penulisan artikel ilmiah. Setiap bab artikel terkait
- Ruang lingkup dan kedalaman pembahasan:** Pembahasan dalam artikel ini dijelaskan dengan baik oleh penulis tentang keberhasilan silika magnetik berlapis CTAB sebagai bahan modifikasi permukaan yang dapat mendegradasi senyawa fenolik dalam air. Ruang lingkup pembahasan didasarkan pada bidang kimia permukaan. Penulis dapat mengaitkan hasil diskusinya dengan referensi dari jurnal internasional ternama dengan penjelasan yang mudah dipahami. Kesimpulan dari artikel ini menjelaskan bahwa adsorpsi fenol ke silika magnetik meningkat dengan meningkatnya densitas misel CTAB pada permukaan. Ini didukung oleh data FTIR dan BET. Penulis mampu menganalisis pengaruh pH dan waktu kontak pada adsorpsi fenol secara lebih rinci. Pembahasan cukup luas dan pekerjaannya dapat diprediksi.
- Kecukupan dan kemutakhiran data/informasi dan metodologi:** Data dan informasi yang dilaporkan cukup mutakhir. Referensi terdiri dari 24 artikel (32 artikel terbit 10 tahun terakhir).
- Kelengkapan unsur dan kualitas terbitan:** Open Chemistry adalah jurnal peer-review yang diterbitkan oleh Walter de Gruyter Jurnal diindeks Scopus dengan SJR 2020 = 0.3. Integritas dan kualitas unsur publikasi sebagai jurnal ilmiah internasional terpenuhi. Similarity index berdasarkan Turnitin adalah 5% sehingga memiliki orisinalitas sangat baik.

Semarang, 10 April 2023
Reviewer 1



Prof. Dr. Dwi Hudyanti, M.Sc
NIP. 19650622 198903 2 001
Unit Kerja : Kimia FSM Undip

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 - Ruang lingkup dan kedalaman pembahasan:** Pembahasan dalam artikel telah dijabarkan oleh penulis dengan baik, mengenai keberhasilan magnetik silika yang dilapisi dengan CTAB sebagai bahan modifikasi permukaan yang mampu mendegradasi senyawa fenol dalam air. Ruang lingkup pembahasan didasarkan pada bidang ilmu kimia permukaan. Penulis mampu mengaitkan hasil pembahasan dengan sumber referensi dari jurnal internasional bereputasi, dengan penjelasan yang mudah dipahami. Kesimpulan pada artikel ini menjelaskan adsorpsi fenol pada magnetik silika akan semakin meningkat dengan peningkatan densitas misel CTAB pada permukaan. Hal tersebut didukung dengan data FTIR dan BET. Bahkan penulis mampu menganalisa lebih dalam pengaruh pH serta waktu kontak pada adsorpsi fenol. Pembahasan cukup mendalam, penelitian sesuai dengan harapan, namun untuk perubahan muatan permukaan perlu uji zeta potensial (11,5)
 - Kecukupan dan kemutakhiran data/informasi dan metodologi:** Data dan informasi yang dijabarkan sudah cukup untuk menjelaskan kemampuan magnetik silika yang dilapisi CTAB mengadsorb fenol dalam air. Metodologi yang dalam artikel juga dijelaskan dengan baik oleh penulis. Sumber referensi yang digunakan cukup mutakhir, terbitan 10 tahun terakhir. dengan referensi yang baik (50 persen) adalah referensi 5 th terkini (12)
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Semarang, 26-03-2021
Reviewer 2

A handwritten signature in black ink, consisting of a stylized 'M' followed by a cursive 'C' and 'D'.

Prof. Dr. Muhammad Cholid Djunaidi, S.Si., M.Si
NIP 19700702 199603 1 004
Unit Kerja : Kimia FSM Undip

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| Total = (100%) | 38,50 | 39,50 | 39,00 |
| Nilai Pengusul = (40% x 39,00) / 4 = 3,90 | | | |

Semarang, 10 April 2023

Reviewer 2



Prof. Dr. Muhammad Cholid Djunaidi, S.Si., M.Si
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Reviewer 1



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Preparation of magnetite-silica-cetyltrimethylammonium for phenol removal based on adsorbilization

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The effect of methyltriethoxysilane (MTES) concentration on hydrophobic properties of silica thin layer

Mustika, L.D. , Azmiyawati, C. , Darmawan, A.
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Structural, thermal and surface properties of sticky hydrophobic silica films: Effect of hydrophilic and hydrophobic precursor compositions

Darmawan, A. , Eka Saputra, R. , Astuti, Y.
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Abstract

In this study, we successfully coated cetyltrimethylammonium-silica on magnetite. The material produced is used to degrade phenol waste in the waters. The effect of the addition of cetyltrimethylammonium bromide (CTAB) on the ability of phenol adsorption was assessed through changes in CTAB concentration of 1, 5, and 10 mM. The results of Fourier-transform infrared spectroscopy explain that CTAB has electrostatic interactions with the silica surface, which is induced

by opposite-loaded patches on the opposite surface of silica oxide. The results of the vibrating sample magnetometer show that the magnetite that has been coated by silica-CTA has magnetic properties that are weaker than the initial magnetite, which indicates that the silica-CTA layer has blocked the magnetite. Based on the measurement of the gas sorption analyzer, the largest pore size is in the micro-mesh region, which is between 2 and 6 nm. All magnetite-silica-cetyltrimethylammonium (MS-CTA) showed good adsorption ability of phenol and correlated with the amount of loaded CTAB and admicelle density of the adsorbent. The amount of phenol adsorbed increases proportionately with the increasing density of CTAB admicelles. The maximum phenol adsorption capacity (0.93 mg g^{-1} adsorbent) is achieved by MS-CTA prepared at a CTAB concentration of 10 mM. © 2020 Choiril Azmiyawati et al., published by De Gruyter.

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
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Research Article

Milan Mitić, Sonja Janković, Pavle Mašković, Biljana Arsić*, Jelena Mitić, Jovana Ickovski

Kinetic models of the extraction of vanillic acid from pumpkin seeds

<https://doi.org/10.1515/chem-2020-0001>

received June 4, 2019; accepted December 2, 2019.

Abstract: Vanillic acid is used in the food industry and perfumery, and the optimization of its extraction process from the natural source is important for saving time and money. The presence of vanillic acid in pumpkin seeds was proven using HPLC analysis. Computational optimization of the extraction shows that for the concentration of ethanol 40% and solmodul: $V/m=20$, the optimum condition for the extraction of vanillic acid from pumpkin seeds was 100 min and 45°C. The estimation of fitting for each kinetic model to the experimental kinetic data was performed using the root mean square, standard deviation, and the correlation coefficient. Ponomarev model was shown as the most suitable with the highest accuracy among the six considered kinetic models. The enthalpy and entropy changes were positive, while the Gibbs free energy was negative and decreased when temperature increased during the thermodynamic analysis. Therefore, the extraction of vanillic acid from pumpkin seeds was endothermic, spontaneous, and irreversible.

Keywords: Extraction yield; Vanillic acid; Pumpkin seed; Ponomarev model.

1 Introduction

Pumpkin (*Cucurbita pepo* L.) is one of the vegetables used in healthy diets as well as in traditional medicine in many countries. Pumpkin seeds (known as pepitas) show high

nutritional and medicinal values, so it is not surprising that they are often recommended against digestive problems in the folk medicine [1]. Cold-pressed pumpkin seeds oil is a rich source of phytosterols tocopherols, squalene [2,3], and minerals [4].

Pumpkin seeds are a rich source of vanillic acid. Vanillic acid (4-hydroxy-3-methoxy benzoic acid) is a secondary metabolism product in plants. It is widely used as a food additive, preservative, and in perfumery [5]. Vanillic acid exerts strong antioxidant activity, but also hypotensive, cardioprotective, hepatoprotective, and antiapoptotic activities, and even gene regulation roles [6-9]. Solid-liquid extraction has been widely used for the isolation of bioactive compounds from different parts of plants. The efficiency of the extraction is affected by several factors: the type of solvent and its concentration, the solvent-solid ratio, pH, time of extraction, temperature, and particle size of the solid matrix [10-13]. Mathematical modeling of the extraction can help in explaining the process, but also in the creation of the optimized extraction process. Kinetic models (either physical or empirical), based on the physical phenomena, might be very complicated. The most often used models are based on film theory and the concept of unsteady-state diffusion through particles: the hyperbolic equation (Peleg's model), the second-order model, and Elovich's equation. Ponomarev's equation, was shown as adequate for the explanation of the slow extraction period [10].

The aim of this paper was searching for the best suited kinetic model for the explanation of the extraction of vanillic acid from pumpkin seeds. Besides, the fitting of each model to the experimental kinetic data was checked using the root mean square, standard deviation, and the correlation coefficient. Thermodynamic parameters (enthalpy, entropy, and Gibbs free energy changes) were found. Finally, the optimization of the extraction process of vanillic acid using computer software JMP (SAS Institute Inc., Cary, USA) was performed.

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Research Article

Ping Tang*, Xiaosheng Tang, Shiyong Mei, Yixi Xie, Liangliang Liu*, Licheng Ren*

Electrochemical antioxidant screening and evaluation based on guanine and chitosan immobilized MoS₂ nanosheet modified glassy carbon electrode (guanine/CS/MoS₂/GCE)

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received August 5, 2019; accepted December 11, 2019.

Abstract: In this study, an electrochemical biosensor based on guanine and chitosan immobilized MoS₂ nanosheet modified glassy carbon electrode (guanine/CS/MoS₂/GCE) was developed and employed for antioxidant screening and antioxidant capacity evaluation. The oxidation peak current of guanine was improved and nearly tripled after modifications of chitosan and MoS₂ nanosheet. The immobilized guanine could be damaged by hydroxyl radicals generated in Fenton solution. However, in the presence of antioxidants, the guanine was protected and the oxidation peak current of guanine increased. This process mimics the mechanism of antioxidant protection in human body. The factors affecting preparation of sensor and detection of antioxidant capacity were optimized. At the optimum conditions, the guanine/CS/MoS₂/GCE showed wide linear range, low detection limit, satisfactory reproducibility and stability for detection. Ascorbic acid was used as a model antioxidant to evaluate the antioxidant capacity. A

good linearity was observed with a correlation coefficient of 0.9959 in the concentrations between 0.5 and 4.0 mg L⁻¹. The antioxidant capacities of three flavonoids were also tested and the rank of antioxidant capacities was ascorbic acid (51.84%), quercetin (45.82%), fisetin (34.39%) and catechin (16.99%). Due to the rapid measurement and low cost, this sensor could provide an available sensing platform for antioxidant screening and evaluation.

Keywords: Antioxidant capacity; Chitosan; Guanine; Hydroxyl radical; MoS₂ nanosheet.

1 Introduction

There is a growing attention paid to the damage of living cells caused by oxidative stress, which is generally associated with the generation of reactive oxygen species (ROS). ROS includes oxygen radicals (O²⁻, ·OH, RO₂·, HO₂·) and byproducts of nonradical oxidizing agents (H₂O₂, HOCl, O₃) that can be easily converted into radicals [1]. When the level of ROS increases dramatically to cause oxidative stress, it could lead to cellular damage to DNA, proteins and lipids, as well as being linked with various human diseases such as rheumatoid arthritis, cardiovascular disorders, cancer and diabetes, etc. [2]. To protect living organisms and counteract the deleterious effects of ROS, complex and sophisticated endogenous and exogenous antioxidant systems are evolved in organisms [3]. The exogenous antioxidant system can be provided by chemical antioxidants such as ascorbic acid, phenolic compounds and flavonoids, which exist in fruit, vegetables and beverages. These antioxidants are important for the protection of human health [4]. Therefore, finding antioxidants and the following evaluation of antioxidant capacity for antioxidants has significant meaning in related research, and there is a

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