

Задание 2

1. Ссылки на электронные публикации по теме «enviromental electrochemistry» в БД ScienceDirect.

Yujing Sun, Lanlan Sun, Baohua Zhang, Fugang Xu, Zhelin Liu, Cunlan Guo, Yue Zhang, Zhuang Li,
Type I collagen-mediated synthesis of noble metallic nanoparticles networks and the applications in
Surface-Enhanced Raman Scattering and electrochemistry,

Talanta,

Volume 79, Issue 3,

2009,

Pages 562-569,

ISSN 0039-9140,

<https://doi.org/10.1016/j.talanta.2009.04.027>.

(<http://www.sciencedirect.com/science/article/pii/S0039914009003294>)

Abstract: In this paper, we demonstrated an effective enviromentally friendly synthesis route to prepare noble metallic (Au, Ag, Pt and Pd) nanoparticles (NPs) networks mediated by type I collagen in the absence of any seeds or surfactants. In the reactions, type I collagen served as stabilizing agent and assembly template for the synthesized metallic NPs. The hydrophobic interaction between collagen and mica interface as well as the hydrogen bonds between inter- and intra-collagen molecules play important roles in the formation of collagen–metallic NPs networks. The noble metallic NPs networks have many advantages in the applications of Surface-Enhanced Raman Scattering (SERS) and electrochemistry detection. Typically, the as-prepared Ag NPs networks reveal great Raman enhancement activity for 4-ATP, and can even be used to detect low concentration of DNA base, adenine, without any label step. Furthermore, the cyclic voltammograms showed Pt NPs networks have good electrocatalytic ability for the reduction of O₂.

Keywords: Type I collagen; Template; Noble metallic nanoparticles; Networks; SERS; Electrocatalysis

M.Z. Abdullah, M. Abdul Mujeebu, Younes Abrouki, Abdelkader Anouzla, S. Aytas, Vassiliki Belessi, J. Beltrán-Heredia, Leticia A. Bernardez, J.P. Canselier, X.H. Chang, D.R. Chen, B. Coco-Rivero, Afonso Avelino Dantas Neto, Luiz R.P. de Andrade Lima, Alcides de Oliveira Wanderley Neto, Ali Deriszadeh, V. Encinas-Sánchez, Danka Galabova, Marisol Gallegos-Garcia, O. Gapurova, Maria Gavrilescu, C. Gok, C. Gourdon, Alexandre Gurgel, B. Haddou, Thomas G. Harding, Maen M. Husein, X.L. Jiao, A.D. Karathanasis, Elena Karpenko, Oleksandr Karpenko, Ather Farooq Khan, Afsar Khan, Rashid A. Khaydarov, Renat R. Khaydarov, Qaisar Mahmood, J.O. Miller, A.A. Mohamad, Ana B. Moldes, N. Muthukumar, Tereza Neuma de Castro Dantas, N. Nishad Fathima, Dimitris Petridis, J. Raghava Rao, Hicham Rbhal, Luigi Rizzo, Mohamed Safi, J. Sánchez-Martín, Sook San Wong, El-Sayed M. Sherif, Alisa Sineva, Shaoxian Song, Anna Sotirova, Salah Souabi, Tjoon Tow Teng, Ling Wei Low, Daniel C.W. Tsang, Balachandran Unni Nair,

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Editor(s): Monzer Fanun,

The Role of Colloidal Systems in Environmental Protection,

Elsevier,

2014,

Pages ix-xiii,

ISBN 9780444632838,

<https://doi.org/10.1016/B978-0-444-63283-8.01002-4>.

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Abdul-Rahman F. Al-Betar, Peter G. Pickup,

Electrochemical n-doping of polyfluorenone films,

Synthetic Metals,

Volume 254,

2019,

Pages 128-133,

ISSN 0379-6779,

<https://doi.org/10.1016/j.synthmet.2019.06.016>.

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Abstract: The n-doping electrochemistry of polyfluorenone (PFO) films prepared by electrochemical polymerization of fluorene-9-one in boron trifluoride diethyl etherate (BFEE) has been characterized. Cyclic voltammetry in acetonitrile showed rapid and reversible n-doping. The potential dependence of the capacitance, measured by impedance spectroscopy, shows that PFO behaves primarily as a redox polymer during n-doping, with localized, non-interacting redox sites. However the potential dependence of the resistance suggests that there are long range effects of conjugation. Deactivation due to charge (cation) trapping occurred during repeated cycling through the n-doping wave. The n-doping capacity can be partially restored by p-doping. Use of polyethylene glycol as a stabilizer decreased the rate of charge trapping, and increased the recovery of n-doping capacity. Scanning electron microscopy revealed that charge trapping was associated with notable changes in the morphology of the PFO film that are characteristic of an annealing process.

Keywords: Fluorenone; Polymerization; Impedance; Charge trapping

Johannes Christoph, Tae-Geun Noh, Jaeyoung Lee, Peter Strasser, Markus Eiswirth,

Spatiotemporal self-organization in the oscillatory HCOOH oxidation on a Pt ribbon electrode – Theory and experiments,

Surface Science,

Volume 603, Issues 10–12,

2009,

Pages 1652-1661,

ISSN 0039-6028,

<https://doi.org/10.1016/j.susc.2008.11.054>.

(<http://www.sciencedirect.com/science/article/pii/S0039602809000508>)

Abstract: Since the current density near the edges of ribbon and disk electrodes is enhanced, the resulting stationary and non-stationary double layer potential is generally inhomogeneous in all electrochemical reactions. We investigate the impact of this edge effect induced spatial inhomogeneity on the pattern formation of the oscillatory formic acid oxidation on thin Pt ribbon electrodes. In order to be able to theoretically describe the spatiotemporal behavior of the double layer potential distribution, we derive and discuss the properties of the electrochemical ribbon coupling function for various distances of the reference electrode. The resulting reaction–migration equation is analyzed in connection with a chemical model accounting for the specific reaction mechanism of the formic acid oxidation. The interaction of structural inhomogeneity, chemically induced temporal instability and nonlocal spatial coupling due to ion migration gives rise to novel types of spatiotemporal behavior. The results compare favorably with experiments conducted so far, which are presented as well and can be explained within the framework of reaction–migration equations.

Keywords: Electrochemistry; Formic acid oxidation; Oscillations; Nonlinear dynamics; Pattern formation

Li Li, Caihong Bu, Yijun Zhang, Jie Du, Xiaoquan Lu, Xiuhui Liu,

Composite system based on biomolecules-functionalized multiwalled carbon nanotube and ionic liquid: Electrochemistry and electrocatalysis of tryptophane,

Electrochimica Acta,

Volume 58,

2011,

Pages 105-111,

ISSN 0013-4686,

<https://doi.org/10.1016/j.electacta.2011.08.097>.

(<http://www.sciencedirect.com/science/article/pii/S0013468611013442>)

Abstract: The combination of biomolecules-functionalized multiwalled carbon nanotube (MWNTs) and ionic liquid (IL) yields nanostructured biointerfaces, formed a novel kind of structurally uniform and bioelectrocatalytic activity material. Rutin was chosen as a model biomolecules to investigate the composite system. The MWNTs–Rutin–IL composite film was characterized by different methods including thermogravimetric analysis (TGA), UV–vis spectra, electrochemical impedance spectroscopy (EIS) and scanning electrochemical microscope (SECM). A pair of well-defined quasi reversible redox peaks of rutin was obtained at the MWNTs–Rutin–IL composite film modified glassy carbon electrode (GCE) by direct electron transfer between the rutin and the GCE electrode. Dramatically enhanced biocatalytic and electrocatalytic activity was exemplified at the MWNTs–Rutin–IL/GCE electrode by the oxidized of tryptophane. The oxidation peak currents of tryptophane in such modified electrode increased linearly with the concentrations of tryptophane in the range from 8×10^{-8} to $2 \times 10^{-5} \text{ mol L}^{-1}$

with a detection limit of $3.0 \times 10^{-8} \text{ mol L}^{-1}$. The unique composite material based on biomolecules-functionalized carbon nanotube and ionic liquid have wide potential applications in direct electrochemistry, biosensors, and biocatalysis.

Keywords: Biomolecules-functionalized multiwalled carbon nanotube; Ionic liquids; Rutin; Electrocatalysis; Tryptophane

N. Iglesias, F. Carranza,

Treatment of a gold bearing arsenopyrite concentrate by ferric sulphate leaching,

Minerals Engineering,

Volume 9, Issue 3,

1996,

Pages 317-330,

ISSN 0892-6875,

[https://doi.org/10.1016/0892-6875\(96\)00016-7](https://doi.org/10.1016/0892-6875(96)00016-7).

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Abstract: Biooxidation can be used as a pretreatment for gold-bearing sulphide ores; it has low reagent costs and is very interesting from an environmental point of view. However the kinetics of this process is slow. Long residence times (several days, even weeks) cause excessive operational costs. If biooxidation proceeds through an indirect contact mechanism, its kinetics may be improved by means of the physical separation of the two operations relating the two effects involved: the chemical attack of sulphides by ferric iron and the biological oxidation of the ferrous iron produced (chemical and biological effects). The separation of the two effects allows the individual enhancement of both stages. In this paper the ferric sulphate leaching of an arsenopyrite concentrate is studied as an example of the Indirect Biooxidation with Effects Separation Process. This method of chemical oxidation has been taken to represent the separation of the chemical and the biological effects within a biooxidation system. The results are very satisfactory. The kinetics of the chemical oxidation stage (ferric sulphate leaching) is enhanced by the use of silver as a catalyst and moderate high temperature. Taking into account that the kinetic activation of the biological ferrous iron oxidation (biological stage) has been already proved, the enhancement of the chemical oxidation stage leads to the whole process improvement.

Keywords: Gold ores; biooxidation; biotechnology

Bingling He, Zhansheng Lu, Dongwei Ma,

Interaction of the O atom with the InSe monolayer: A first-principles study,

Vacuum,

Volume 153,

2018,

Pages 53-61,

ISSN 0042-207X,

<https://doi.org/10.1016/j.vacuum.2018.04.002>.

(<http://www.sciencedirect.com/science/article/pii/S0042207X17319061>)

Abstract: The interaction of the O impurity atom with the InSe monolayer has been investigated by using first-principles calculations. O atoms energetically highly tend to be located at the inner of the material between the In-In bond. The energy barrier (0.53 eV) for the O diffusion from the topmost atomic layer to the material inner is much smaller than that (1.12 eV) for the diffusion across the topmost atomic layer. These suggest that the O atom on the topmost atomic layer can rapidly diffuse into the material inner far below room temperature. However, the rapid diffusion of the O atom in the material inner may need an elevated temperature, due to its higher diffusion energy barrier of 0.99 eV. For the electronic structure, O impurity single atoms are most likely to only induce a slight change in the bandgap, and moderate changes in the band dispersion and the carrier effective masses of the valence and conduction bands. Further, a higher concentration of O impurities in the inner of InSe has been studied. Our studies are helpful for understanding of the oxidation, environmental stability, and electronic properties of InSe two-dimensional semiconductors at the atomic level, due to the O impurity.

Keywords: First-principles calculation; Inse; Oxygen impurity; Adsorption; Diffusion; Electronic structure

Kun WANG, Zhan-Hui TAO, Lei XU, Ya-Qing LIU,

Research and Development of Functionalized Aptamer based Biosensor,

Chinese Journal of Analytical Chemistry,

Volume 42, Issue 2,

2014,

Pages 298-304,

ISSN 1872-2040,

[https://doi.org/10.1016/S1872-2040\(13\)60712-4](https://doi.org/10.1016/S1872-2040(13)60712-4).

(<http://www.sciencedirect.com/science/article/pii/S1872204013607124>)

Abstract: In recent years, aptamer-based biosensors have been quickly developed due to its characteristic such as high sensitivity & selectivity, excellent stability and extensive application in various fields. According to different principles various aptamer biosensors have been designed. In this review, we mainly focused on the development of electrochemical, fluorescent and colorimetric aptamer sensors. The potential development of aptamer-based biosensors has also been discussed.

Keywords: Aptamer; Biosensor; Electrochemistry; Fluorescence; Colorimetry; Review

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