**Journal of the Serbian Chemical Society**

**Review Version：**7223-38429-2-RV

**Title:**  Electrochemical oxidation of Sulfamethoxazole using Co modified PbO2 electrode through Artificial neural networks coupled with Particle swarm optimization

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ADDITIONAL COMMENTS

Please indicate the page numbers for suggested corrections. Please, be as specific as possible if major correction by the author(s) is recommended!

Response: We agree with the reviewer’s comment. According to the reviewer’s comments, page numbers have been added in the text.

1. Some typos, grammatical errors are in the manuscript; they should be corrected. For example, ‘‘were’’ should be removed in the Introduction part, paragraph 4, line 75.

Response: We thank the Reviewer’s for his/her kind suggestion about our English. We have carefully corrected the grammar errors and badly worded/constructed sentences in our revised manuscript and made the revision meet the requirements of scientific English. All the revisions were highlighted with red fonts in the revision.

1. The quality of figures is very low and it should be improved.

Response: We are grateful with the reviewer’s kind comment. We have reworked all the figures to increase the resolution as much as possible and made the revision meet the requirements of Journal of the Serbian Chemical Society.

1. Fig.1 and Fig. 2 should be named as Scheme 1 and Scheme 2, respectively.

Response: We agree with the reviewer’s comment. According to the reviewer’s comments, the Fig.1 and Fig. 2 were named as Scheme 1 and Scheme 2, respectively. The revisions were highlighted with red fonts in the revision.

1. Please pay attention to the distance between number and unit; for example, ‘‘1-20mAcm-2’’ should be rewrite as ‘‘1-20 mAcm-2’’, in the Abstract part, line 13.

Response: We agree with the reviewer’s comment. According to the reviewer’s comments, the distance between number and unit were rewrite to keep consistency. The original sentence “Effects of current density (1-20mA cm-2)…..” **was rewritten to** “Effects of current density (1-20 mA cm-2)…..”. Other relevant expressions in revision were also revised. All the revisions were highlighted with red fonts in the revision.

1. The parameters amounts of rows 1 and 3 were removed in Table 2; they should be added.

Response: We thank the reviewer very much for his/her kind comment. The parameters amounts of rows 1 and 3 removed in Table 2 were added in Table 2.

1. Please use published articles for comparison of your work with the other works in a Table.

Response: We agree with the review’s comments. Instead of making comparison directly in the Introduction section, we rewrote the relevant contents by stating references briefly in the Introduction, and used published articles for detailed comparison of our work with the other works in this following Table.

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| --- | --- | --- |
| Articles | Their conclusion | Comparison with ours |
| 1. Ciríaco L, Anjo C, Correia J, et al. Electrochemical degradation of ibuprofen on Ti/Pt/PbO2 and Si/BDD electrodes[J]. Electrochimica Acta, 2009, 54(5): 1464-1472.
 | The electrochemical oxidation of Ibuprofen (Ibu) was performed using a Ti/Pt/PbO2 electrode as the anode. Tests were performed with model solutions of Ibu, with concentrations ranging from 0.22 to 1.75 mM for the Ti/Pt/PbO2 electrode and 1.75 mM for the BDD electrode, using 0.035 M Na2SO4 as the electrolyte, in a batch cell, at different current densities (10, 20 and 30 mA cm−2). The results showed a very good degradation of Ibu, with COD removals between 60 and 95% and TOC removals varying from 48 to 92%, in 6 h experiments. | In our works, the effects of the major factors on kinetics were investigated in detail, including current density, pH, the initial concentration of SMX, electrolyte concentration and degradation time. Whereas, their article only investigated the effect of pH, Ibu concentration and current density on the degradation of Ibu. |
| 1. de Amorim K P, Romualdo L L, Andrade L S. Electrochemical degradation of sulfamethoxazole and trimethoprim at boron-doped diamond electrode: performance, kinetics and reaction pathway[J]. Separation and Purification Technology, 2013, 120: 319-327.
 | The BDD anode is a better electrochemical anode because it nearly completely mineralizes SMX and its intermediates, achieving high removal efficiencies of SMX (≈100%), COD (>90%) and TOC (>90%). However, the BDD anode had a relatively high price ($15,000–22,000 / m2) and this limits its industrial applications. | In our works, a Co modified PbO2 DSA electrode were made as the anode, the actual SMX removal efficiency of 92.03% ± 2.30% were achieved under the optimized conditions. In contrast to their BDD anode, our anode had a much lower cost of $18,00–21,00 / m2, which made the industrial applications more promising. |
| 1. Elfghi F M. A hybrid statistical approach for modeling and optimization of RON: A comparative study and combined application of response surface methodology (RSM) and artificial neural network (ANN) based on design of experiment (DOE)[J]. Chemical Engineering Research and Design, 2016, 113: 264-272.
 | Their article presented a comparative study and combined application between response surface methodology (RSM) and artificial neural networks (ANN) based on design of experiment strategy in the modeling and prediction of the research octane number. Based on the results of analysis of variance (ANOVA), a multiple determination coefficient of 0.8 and 0.99 were obtained for both RSM and ANN respectively. The study revealed that, the maximum RON of 88 was obtained at the optimum conditions offered by RSM. Furthermore, at the optimal conditions, the maximum RON of 98 was obtained for the ANN model. ANN methodology showed a very obviously advantage over RSM for both data fitting and estimation capabilities. | To our knowledge, limit studies have hitherto been reported concerning the modeling and optimization for the electrochemical oxidation of SMX by ANN coupled with PSO. The study presented an ANN which developed to model the SMX removal through the EO process.The representation of predicted SMX removal efficiency versus experimental data for all data showed a good predictive ability of the proposed ANN model. The high value of R2 (0.9826) suggested that the current ANN model was suitable for the prediction of data. |

1. Report the relative standard deviation (RSD) for Removal Efficiency in Table 2.

Response: We agree with the review’s comments. Actually, under identical conditions, triplicate samples were measured and their averages of the data were reported to prevent any possible errors introduced by the sampling procedure in our study. The relative standard deviations were **added** in **Table.2** of our revision.