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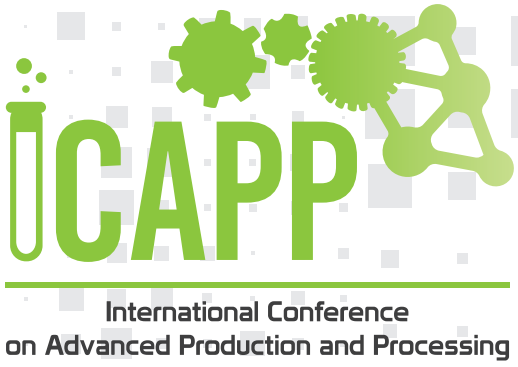

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A SENSITIVE VOLTAMMETRIC SENSOR FOR CAFFEIC ACID MADE FROM THERMOLISED MODIFIED UF RESINS WITH INCORPORATED Fe(III) AND Ti(IV) OXIDE PARTICLES

***Branka Petković*[1], *Marija Kostić*[2], *Suzana Samaržija-Jovanović*[1], *Aleksandra Ivanović*[3], *Bojana Laban*[1], *Djordje Veljović*[4], *Dalibor Stanković*[5]**

[1]*Faculty of Sciences and Mathematics, University of Priština-Kosovska Mitrovica, Lole Ribara 29, 38220 Kosovska Mitrovica, Serbia, branka.petkovic@pr.ac.rs; suzana.samarzija@pr.ac.rs; bojana.laban@pr.ac.rs*
[2]*University of Novi Sad, Faculty of Technology Novi Sad, Bulevar cara Lazara 1, 21000 Novi Sad, Serbia, kostic.marija@uns.ac.rs*
[3]*Mining and Metallurgy Institute Bor, Zeleni bulevar 35, Bor, Serbia, aleksandra.ivanovic@irmbor.co.rs*
[4]*University of Belgrade, Faculty of Technology and Metallurgy, Karnegijeva 4, 11000 Belgrade, Serbia, djveljovic@tmf.bg.ac.rs*
[5]*University of Belgrade, Faculty of Chemistry, Studentski trg 12-16, 11000 Beograd, Serbia, dalibors@chem.bg.ac.rs*

Domestic high performance electrode material was prepared by thermolysis of *in situ* synthesized urea-formaldehyde (UF) resins modified with Fe(III) nitrate and Ti(IV) oxide in different combinations: iron salt and UF resins (SynFe/UF-TP), titan oxide and UF resins (SynTi/UF-TP) and both metal compounds together and UF resins (SynFe+Ti/UF-TP). For comparison, the thermolysis prepared materials produced by simple physical mixture of metal compounds and UF resins (Fe/UF-TP, Ti/UF-TP and Fe+Ti/UF-TP) were made, too. The surface morphology characterization of all materials were done by SEM. Electrochemical results obtain by cyclic voltammetry and impedance spectroscopy have shown that *in situ* synthesized UF material modified with iron and titan compounds prepared by thermolysis, incorporated in carbon paste electrode (SynFe+Ti/UF-TP@CPE) possesses a better electrochemical response and conductivity than the other materials prepared by the same procedure, or pure CPE without addition of extra material. After optimization of experimental conditions and parameters of differential pulse technique, selectivity of proposed electrochemical method was examined. The proposed sensor with incorporated developed material has proven itself as a selective and sensitive electrochemical platform for determination of caffeic acid (CA). It was successfully applied for the determination of antioxidant capacity, based on CA equivalents, for honey, liqueur and juice samples.

Keywords: Modified urea-formaldehyde resin, Thermolysis, Voltammetric sensor, Caffeic acid

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INFLUENCE OF MODIFIED MONTMORILLONITES ON FORMALDEHYDE CONTENT IN UREA-FORMALDEHYDE/MONTMORILLONITE COMPOSITES

Mirjana Ristić[1], Suzana Samaržija-Jovanović[1], Vojislav Jovanović[1], Marija Kostić[2], Tijana Jovanović[3], Gordana Marković[4], Milena Marinović-Cincović[5]

[1]Faculty of Sciences and Mathematics, University of Priština-Kosovska Mitrovica, Lole Ribara 29, 38220 Kosovska Mitrovica, Serbia, mirjana.ristic997@gmail.com; suzana.samarzija@pr.ac.rs; vojislav.jovanovic@pr.ac.rs
[2]University of Novi Sad, Faculty of Technology Novi Sad, Bulevar cara Lazara 1, 21000 Novi Sad, Serbia, kostic.marija@uns.ac.rs
[3]Faculty of Science and Mathematics, University of Niš, Višegradska 33, 18000 Niš, Serbia, tijana.jovanovic@pmf.edu.rs
[4]Tigar AD, Nikole Pašića 213, 18300 Pirot, Serbia, gordana11markovic@gmail.com
[5]Vinča Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, Mike Petrovića Alasa 12-14, 11000 Beograd, Serbia, milena@vinca.rs

The effect of different montmorillonites (KSF and K10) and their modifications (Na-KSF, Na-K10) on content of formaldehyde-FA (free and liberated) modified urea-formaldehyde (UF) composites was investigated. KSF and K10 were modified by sodium chloride (NaCl). A total of four samples were synthesized, with the designations UF/KSF, UF/Na-KSF, UF/K10, and UF/Na-K10, under the same conditions. The content of free FA was determined by the bisulfite method. The hydrolytic stability of modified UF resin was determined by measuring the concentration of liberated FA of modified UF composites after acid hydrolysis. The specific surface area of the tested montmorillonites was determined by the Sear's method. Higher values of specific surface area were obtained for pure KSF (149.4 m^2/g) compared to modified Na-KSF (48.6 m^2/g). Specific surface area for pure K10 was 111 m^2/g, compared to value of 71 m^2/g for modified Na-K10. The amount of free and liberated FA was 0.4%, 0.12% and 1.2% and 2.3%, respectively for UF/KSF and UF/Na-KSF composite. The values for free FA for UF/K10 and UF/Na-K10 composite are the same and amount to 0.6%. It was concluded that the UF/Na-KSF composite has a smaller content of free FA (0.12%) compared to other UF composites. The UF/KSF composite has a higher resistance to acidic hydrolysis and lower liberated FA percent (1.2%).

Keywords: Montmorillonite, Free and liberated formaldehyde, Urea-formaldehyde composite

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