

АКАДЕМИЈА НАУКА
И УМЈЕТНОСТИ
РЕПУБЛИКЕ СРПСКЕ



ACADEMY OF SCIENCES
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САВРЕМЕНИ МАТЕРИЈАЛИ 2013**

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И
КЊИГА АПСТРАКАТА

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The scientific conference will take place in the Great hall of ASARS.

is conducted on computer numerical control engraving machine using a diamond scraper. Different values of process parameters are combined to determine adequate parameters set from groove edge quality aspect. Advanced equipment is used for qualitative analysis and near-optimal cutting condition selection. The results are basis for further process optimization of thin fullerene film micro-engraving and the introducing of cutting conditions in existing table for well-known materials.

Keywords: fullerene film, cutting condition setting, micro-engraving.

ANALYSIS OF CONSUMPTION NITROGEN NEAR LASER CUTTING STAINLESS STEEL

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While laser cutting is possible to use three types of gas, depending on the type and thickness of the base material. These are respectively, compressed air, oxygen (O₂) and nitrogen (N₂). Nitrogen is used in the purity of 99.99%. Consumption of nitrogen participates in cost cutting parts made of stainless steel in an amount that is much higher than the price itself material to be processed. Given the high cost of nitrogen and the need to establish cost of laser cutting, it is necessary to make a calculation of consumption of nitrogen when cutting stainless steel and materials that intersect with the same other parameters cutting. Input parameters were obtained by measuring the actual cutting parameters. Used a battery of nitrogen from 12 bottles total weight of 969 kg. How the to prevent the ingress of air into the battery, the entire amount of nitrogen from the battery is not discharged to the end, the analysis will not take the amount of nitrogen in liters or kg, already price of gas of spent in convertible marks.

Keywords: laser cutting, nitrogen, stainless steel, costs calculation.

ANALYSIS OF HEXAVALENT CHROMIUM SORPTION ON MACROPOROUS COPOLYMER GRAFTED WITH HEXAMETHYLENE DIAMINE

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Functionalized polymers based on glycidyl methacrylate are very attractive and effective metal adsorbents since they can be regenerated and reused, while epoxy group can be easily transformed into various functionalities. In this study, macroporous GMA

based copolymers with different crosslinking degree and porosity parameters, functionalized with hexamethylene diamine (PGME-HMDA), were tested for Cr(VI) sorption. Sorption kinetics and adsorption isotherms were obtained in static experiments with a series of acidic aqueous solutions of Cr(VI) ions in the concentration range 0.01-0.1 mol/dm³, at room temperature (298 K) and pH=1.8. Concentration of Cr(VI) ions after sorption was analyzed by ICP-OES. Several kinetic models (chemical reaction- and diffusion-based) were used for sorption kinetics analysis. Acknowledgements. This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Projects III43009, TR37021 and ON172062).

Keywords: Cr(VI) ions sorption, hexamethylene diamine, kinetic models, ICP-OES.

EPOXY CATAPHORETIC COATINGS ON STEEL MODIFIED BY Zn-Mn ALLOYS

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There are many factors that influence the corrosion stability of organic coatings and surface pretreatments play an important role. Pretreatments based on zinc coatings alloyed with iron-group elements have been widely investigated during a last decade. However, steel surface modification with Zn-Mn coating prior to deposition of organic coating has not been investigated so far. In this work an attempt has been made to determine the influence of steel surface pretreatments with electrodeposited Zn-Mn alloy on the adhesion and corrosion stability of thin, nonpigmented epoxy coating. Epoxy coating was deposited cathodically from epoxy emulsion during different times and at both low and high voltage. The corrosion stability of protective systems was analyzed by electrochemical impedance (EIS) in 3% NaCl solution. The appearance of two time constant EIS plots, after only 24 h of exposure to corrosion agents, in protective system based on epoxy coating deposited at low voltage indicates its poor corrosion stability. This behaviour was confirmed by adhesion measurements. Based on all results the optimum deposition time and voltage were determined.

Keywords: Zn-Mn alloy, cathodic deposition, epoxy coating, corrosion.