

Organic Chemistry 2020: APPLICATION OF TAUNIT CARBON NANOTUBES AND ULTRAFINE DISPERSED DIAMONDS IN GALVANOTECHNICS - Tambov State Technical University

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Abstract

The creation of electrochemical metal and anodic oxide coatings with improved performance properties is one of the important directions in the development of electroplating. One of the rapidly developing ways to improve the characteristics of coatings is the use of nanomaterials in electrolyte formulations. The aim of the work is to create technologies for the production of nanomodified galvanic coatings with improved quality indicators. To achieve this goal, galvanic electrolytes were supplemented with nanocarbon material registered under the Taunit trademark. For the uniform distribution of nanocarbon in the electrolyte, the electrolyte treatment by ultrasound was used. In addition, the technology of using effervescent soluble tablets has been developed. The properties of coatings obtained by electrodeposition from electrolytes containing carbon nanotubes "Taunit" are studied. It was found that carbon nanotubes turn out to be additional centers of crystallization, as a result, the size of the coating crystal decreases and the coating becomes more wear-resistant, hard and corrosion-resistant. The concentrations of nano-additives "Taunit", at which the best quality indicators are achieved, are revealed. For zinc coating, the addition of 40 mg / l nanoadditives increases corrosion resistance by 4 times. For nickel and chrome plating, the addition of 70 to 80 mg / l nano additives increases wear resistance by 20%. The technology of obtaining nanomodified anodic-oxide coating of aluminum has been developed. The resulting coating has morphology with microprotrusions, as a result of which the coefficient of heat transfer from aluminum to air will increase by 23%. Similar positive results were obtained in many world scientific centers using nanodiamonds as an additive to electrolytes. The next stage of our

work is the use of mixtures of nanodiamonds and nanomaterial "Taunit" as additives in electrolytes.