

oscillograph. The <<POR>> film used in the second method is a radiation-sensitive film. Allocating two films in front of the sample and behind it, the difference of radiation absorbed dose between these films will be equal to the dose absorbed by the sample  $\Delta D = \Delta D'' - \Delta D'$ . A spectrophotometer is applied for the calculation of radiation absorbed dose.

The method using faraday cup was proved to be inexpedient because of major inaccuracy (the value of the dose is 913.2 KGy). Application of the second method using <<POR>> dosimetric films provided more valid value of the dose absorbed by the sample (26.31 KGy). Further research should be carried out for the optimization of technological regimes of polymers modification on basis of polymilk acid irradiation with impulsive electronic beams. Structure and properties of polymeric materials also have to be studied.

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#### THIN HYDROXYAPATITE COATING ON AZ91D MAGNESIUM ALLOY FABRICATED VIA RF-MAGNETRON SPUTTERING

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The development of biodegradable materials for bone injuries repair is an attractive scientific topic [1]. The wettability of the bare alloy and HA coating deposited on Mg alloy was monitored. It was revealed that after only 15 min of water droplet spreading over the surface a significant decrease in the water contact angle (from 100° to 66°) was observed. A significantly higher water spreading rate was observed in the case of bare alloy compared with that of the HA coated samples. The observed changes in the surface wettability over time indicated a strong time-dependent tendency to turn initially hydrophobic behavior to hydrophilic. The aim of this study was to investigate the structure, chemical composition and wettability of the CaP coating deposited via RF magnetron sputtering on AZ91D magnesium alloy.

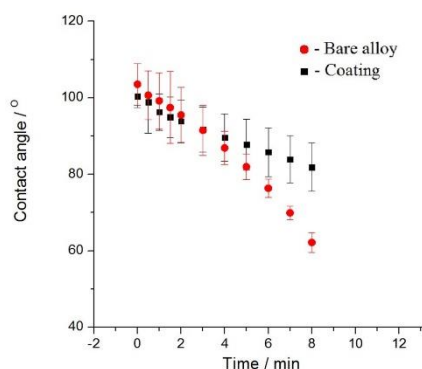


Figure 1. Water spreading behavior of a single droplet on the surface of the HA coating and bare alloy

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In this study, fabrication process and the properties of the HA coating deposited onto AZ91D magnesium alloys via RF-magnetron sputtering are described. Surface morphology and structure results suggested that the coating is crystalline HA with the uniform, homogeneous, and dense structure. Investigations did not reveal improvement of the surface wettability of the HA coated samples compared to the bare alloy, however water contact angle dynamics in the case of the HA coated substrates revealed a lower rate of a droplet spreading over the surface. The initially hydrophobic surface of the HA coating tend to be more hydrophilic with time.

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#### ELECTROIONITE PROCESSES IN TWO-PHASE EXCHANGE SYSTEMS

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Separation by ion-exchange of isotopes and ions mixture used in processes of purification and selective extraction of valuable components from solution for the enterprises of the nuclear industry is actual. Application of the given processes for exchange systems with electroregeneration of ion-exchange material used on sorption stages we considered.

Separation process efficiency depends on type ionite, its charge and the sizes, structural characteristics, the sizes in hydrated and dehydrated conditions [1], environment temperature and the nature anions, connected with cation in a solution. We had considered two-phase exchange systems with use organic and inorganic [2] cations.

The evident influence on conditions of ion-exchange sorption and ions with close properties separation is provided by means of the organic solvents additive to aqueous solutions of salts. The increase in separation factors of alkaline metals ions in aqueous-propanol solutions is connected with their dependence on solvation energy and a dielectric constant for equilibrium ions and increase of solvation energy at transition from aqueous to aqueous-alcoholic [3] solutions.

Collation of the received values shows, that on cation-exchange resin KU-2 the separation factors are higher than on carboxyl resin CB-4P×2. It explains that cation-exchange resin KU-2 from aqueous-propanol solutions mainly absorbs water as more polar component, and, hence, viscosity of environment inside of grain ionite is less while in cationite CB-4P×2 at swelling the quantity the propanol not much more decreases in comparison with an external solution and viscosity of environment inside of grain ionite above that directly influences conditions exchange sorption. Besides fixed carboxyl groups are less dissociated, than strong-acid a sulfate group, that also influences efficiency of ionic exchange.