

MAGNETICALLY OPERATED STRUCTURING OF STEEL SURFACES FOR THE OBTAINING OF ATTACHMENTS FOR MAGNETIC FILTERS

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The problem of the cleaning of various working media is still actual because of the diversity of the destination objects and the demands to the quality of their extraction. The magnetic separators (MS) have got the wide spread occurrence for the fine purification of the working mediums practically in all fields due to the applications of modern technologies of the magnetic labeling of the destination objects. The MS with the high-gradient ferromagnetic attachments (HGFA) are used for the effective extraction of these objects with the minimal quantity of the magnetic marks that have branchiate structure of the surface with elements commensurable with the sizes of the destination objects. After the placement of this attachment to the external magnetic field in the environment of the heterogeneity of the attachment, the high-gradient magnetic fields generate and serve as the centers of capturing of the destination objects of micron- and submicron-level sizes. The attachments of this type proposed in works [1,2] have high effectiveness but high cost and are laborious in production. The economically sound and simple methods of producing of HGFA are suggested in this work, i.e., the method of the plating of the nickel dendrites in external magnetic field on the steel net and the method of the magnetically operated corrosion. The dendrite plating was placed in the cavity, where the sheet nickel was used as an anode, and the preliminary nickel-plated iron net was a cathode (the basis for the HGFA). The control of dendrites' sizes was carried out by changing of the time of the nickel plating, the amount of the external magnetic field, the composition of electrolyte. The testing of the attachment, received in such a way, has shown its high effectiveness. After 30 minutes of separation one layer of the attachment extracted 90 % of the magnetically marked biosorbent *S.cerevisiae*, by using of which the copper ions were preliminarily extracted from water solution. Two layers extracted 98% of the magnetically operated biosorbent. The HGFA, obtained by the methods mentioned above, have small materials consumptions, high contaminant capacity, small hydrodynamic resistance and are able to provide with high fineness of the cleaning of working media in biology and medicine.

References

1. Laura A.Worl. // The Actinide Research Quarterly. Nuclear Mater. Techn. Division. - 1999. - Pp. 1-3.
2. Wang J., Chen C. // Biotechnology Advances. - 2006. - V. 24. - Issue 5. - Pp. 427-451.