



Research monograph

- 115.** Effect of the front electrode metallisation process on electrical parameters of a silicon solar cell
L.A. Dobrzański, M. Musztyfaga (Poland)

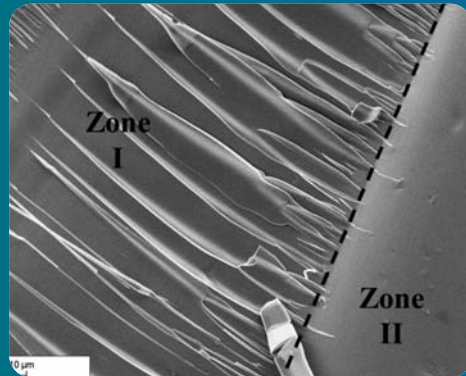


Materials

- 145.** Structure and physical properties of Fe-based metallic glasses with Ni and Co addition
S. Lesz, R. Nowosielski (Poland)
- 153.** Fe-based bulk metallic glasses prepared by centrifugal casting method
R. Nowosielski, R. Babilas (Poland)
- 161.** Thermal stability and GFA parameters of Fe-Co-based bulk metallic glasses
R. Nowosielski, A. Januszka (Poland)

- 169.** The influence of initial powder properties on the mechanical alloying process and the final powders structure
W. Pilarczyk, R. Nowosielski, M. Szymczak (Poland)

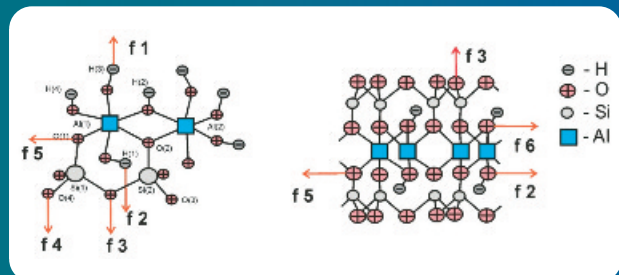
- 177.** Selected properties of the halloysite as a component of Geosynthetic Clay Liners (GCL)
P. Sakiewicz, R. Nowosielski, W. Pilarczyk, K. Gołombek, M. Lutyński (Poland)



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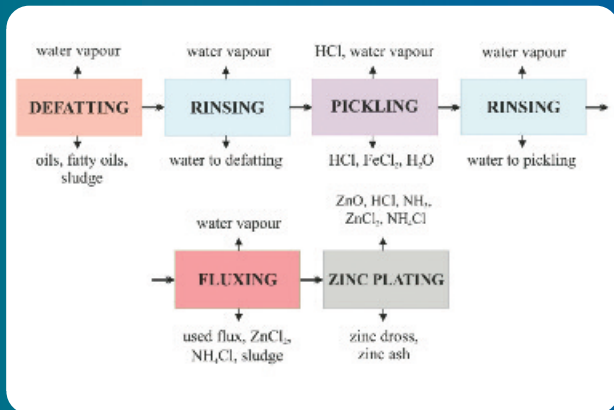
The Materials section represented by R. Nowosielski and R. Babilas on "Fe-based bulk metallic glasses prepared by centrifugal casting method" on a page 153 describes a casting method,

structure characterization and chosen properties analysis of Fe-based bulk metallic glasses in as-cast state. The studies were performed on $Fe_{72}B_{20}Si_4Nb_4$, $Fe_{36}Co_{36}B_{19}Si_5Nb_4$, $Fe_{43}Co_{14}Ni_{14}B_{20}Si_5Nb_4$ metallic glasses in form of rings. The amorphous structure of tested samples was examined by X-ray diffraction (XRD), transmission electron microscopy (TEM) and scanning electron microscopy (SEM) methods. The crystallization behaviour of the studied alloys was examined by differential thermal analysis (DTA). The soft magnetic properties examination of tested materials contained initial magnetic permeability and magnetic permeability relaxation measurements. The XRD and TEM investigations revealed that the studied as-cast bulk glassy samples in forms of a ring were amorphous for all tested alloys. The SEM images showed that fractures of studied rings indicated two structurally different zones, which contained "river" patterns and "smooth" areas. The samples of studied alloys presented two-stage crystallization process, which was observed for all tested rings with different thickness. The changes of crystallization temperatures versus the thickness of the glassy samples were stated. The centrifugal casting method is a very simple, useful and effective method to produce bulk amorphous materials in a form of rings or tubes.



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In the paper entitled "Selected properties of the halloysite as a component of geosynthetic clay liners (GCL)" by P. Sakiewicz, R. Nowosielski, W. Pilarczyk, K. Gołombek and M. Lutyński on a page 177 some properties of halloysite and its applications as a component of Geosynthetic Clay Liners (GCL) are presented. The following paper presents results of comparative tests of the influence of different factors on the halloysite and halloysite – bentonite mixture properties. Halloysite shows high sorption properties in relation to toxic heavy metals (eg cadmium, lead) and solutions containing harmful hydrocarbons, eg benzene, as well as toxic gases (ammonia, hydrogen sulfide). They are in aqueous solutions, therefore, their capacity for migration through protective barriers sometimes pose a growing threat to the environment. Using halloysite as a component of GCL significantly reduced this problem. Studies described in this work should help to improve composition and optimize parameters of sealing clay mixtures improving activities and functioning of GCL during a long period of time. The comparison of the effects of the halloysite additive on characteristics of sealing clay layers properties and the possibility of its application in this area. Knowledge about changing of GCL properties during long time exploitation in landfills allows for the selection of theirs main sealing parameters. The wrong choice of GCL parameters leads to the multiplication of environmental costs and pollution of the area around the storage place.



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The paper written by R. Nowosielski and A. Kania on "Ecological optimisation of materials technological processes" on a **page 192** discusses the Procedure of the Optimum Materials Technological Process (POMPT) with Poli-Opt version 1.0 programme to optimisation of materials technological processes. In this paper the essence of multicriterial optimisation was presented. The method of the polyoptimisation – genetic algorithms (GA) for the technological processes optimisation has been showed. The application of the POMPT procedure by a general analysis and estimation for 4 zinc plating technological processes has been tested and illustrated. The proposed POMPT procedure of technically, ecologically and economically optimum materials technological process is the effective and relatively simple tool making possible the analysis and estimation of the technological processes and the optimisation of a group of the materials technological processes in the direction of the improvement of the negative environmental influences. The presented POMPT procedure is not the closed solution but it is the object which should be a subject to further testing and improvements in the range of the optimisation methodology usage and information technique.



Cleaner production and biotechnology

- 192. Ecological optimisation of materials technological processes
R. Nowosielski, A. Kania (Poland)
- 200. Sustainable technological process as an element of the sustainable development strategy realisation
R. Nowosielski, M. Spilka (Poland)



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The Cleaner production and biotechnology section represented by R. Nowosielski and M. Spilka on "Sustainable technological process as an element of the sustainable development strategy realisation" on a **page 200** describes the possibility of the sustainable development conception realisation through the sustainable technological processes designing and implementation. The definition, the model of the sustainable technology and the sustainable development conception are relative and they have not a clear character. It means that there is no possibility of absolutely the best technology or technological process determination. Because of that we can only design the better process in the comparison with another one with regard to adequate criteria. The paper includes the analysis and the estimation of the nickel and chromium coated on the metal elements. In order to modernize the real process in direction to the sustainable process, the technical solutions which minimise influence on the environment of galvanic treatment process were presented. The sustainable technological process reduces the achievement of the sustainable development to the small area analysis which is the technological process, what makes possible the quantitative estimation (in the internal area of technology).

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