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Materials

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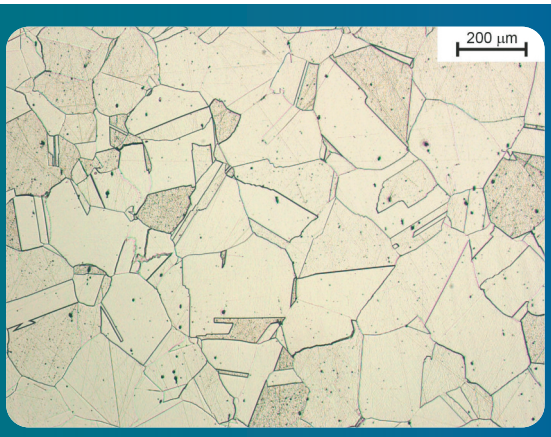

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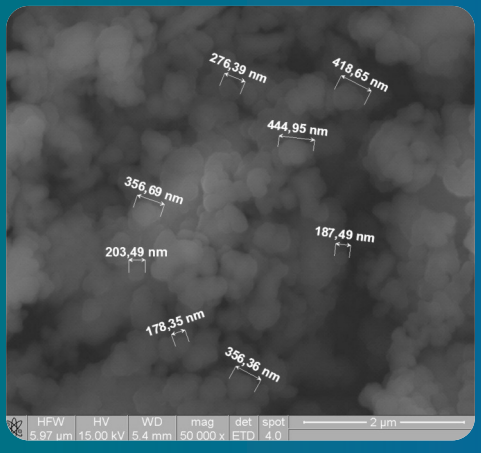
The research paper made by L.A. Dobrzański, W. Borek and M. Ondrula on "Thermo-mechanical processing and microstructure evolution of high-manganese austenitic TRIP-type steels" on a **page 59** describes the influence of hot-working conditions on microstructure evolution and phase composition of new-developed high-manganese austenitic TRIP-type steels. To determine in details the microstructure evolution during industrial rolling, the hot-working schedule should take into account a real number of passes and higher strain rates. The hot-working behaviour was determined in continuous and multi-stage compression tests performed in a temperature range of 850 to 1100°C by the use of the Gleeble 3800 thermo-mechanical simulator. The processes controlling work hardening and removing it were identified by microstructure evolution observations in different stages of compression with the amount of true strain 4x0.23. A phase composition of steels was confirmed by X-ray diffraction analysis. It was found out that they have austenite microstructure with numerous annealing twins in the initial state. Continuous compression tests realized in the temperature range from 850 to 1050°C with the strain rate of 0.1, 1 and $10s^{-1}$ enabled determination of yield stress values and values of ε_{max} deformations – corresponding to maximum flow stress. The investigated steels are characterized by high values of flow stress from 120 to 380 MPa. Results of the multi-stage compression proved that applying the true strain 4x0.23 gives the possibility to refine the austenite microstructure. The obtained microstructure – hot-working conditions relationships and stress-strain curves can be useful in determination of power-force parameters of hot-rolling for sheets with fine-grained austenitic structures.



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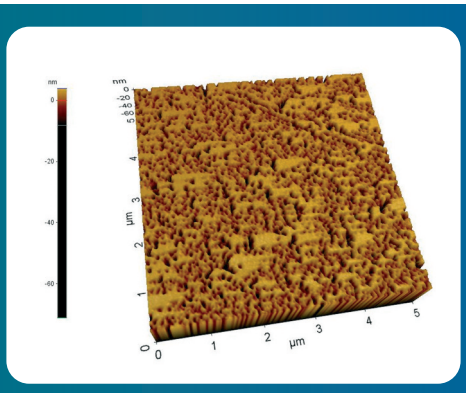
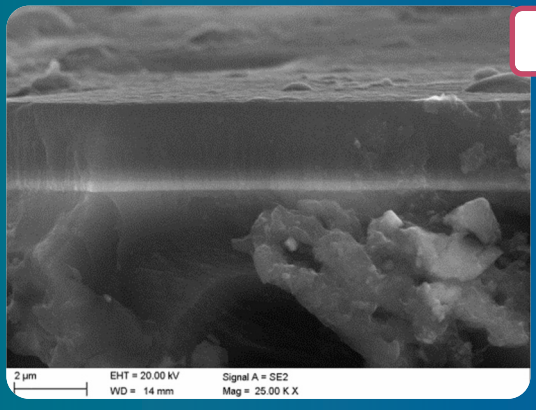
In the paper entitled "Modification of the structure of the layers of superficial soda – calcium – silicon glasses nano molecules inorganic compounds" by M. Drajewicz and J. Sieniawski on a **page 76** a new surface treatment of glass is presented. Testing results of the glass operational properties, such as bending strength, scratching resistance, micro-hardness, chemical resistance and optical properties have been presented. Nano-molecules were spread onto the heated glass surface, or onto cold glass surface and then heated up to temperatures close to the glass transformation, when nano-molecules penetrate into the glass surface. Refining method of soda – calcium – silicon glassy surfaces with inorganic compounds nano-molecules assures profitable operational properties of the glass, such as increased bending strength, scratching resistance, micro-hardness and chemical resistance without deterioration of the optical properties. Optimal technical and technological parameters of the refining process have been selected. The presented method undoubtedly develops new possibilities not only in case of container glass, float glass and glass fibres but also in the field of glass processing.



Authors: J. Weszka, P. Jarka, M. Chwastek-Ogierman and B. Hajduk in the paper entitled "Researches of topography and optical properties of the thin films NiPc/PTCDA donor acceptor couple" on a **page 81** present surface topography and optical properties of organic thin films of NiPc: PTCDA blends deposited by thermal evaporation from one source. Thin films of organic materials are provided as donor/acceptor couple in heterojuction solar cells. Films consisting of NiPc and PTCDA mixture were deposited by thermal evaporation from one source. By using blends with different PTCDA to NiPc ratios and steering the temperature of the sources and hence deposition rate different properties of layers are obtained. Both the chemical composition and technological parameters of deposition process has appeared to influence on optical properties and surface morphology of thin films. These parameters were found to influence surface morphology and UV-Vis absorption spectra. Results of researches suggest that blends of NiPc and PTCDA can be useful materials in organic photovoltaic device. However, right deposition parameters and the blends proportions determine the properties of NiPc/PTCDA donor/acceptor thin films. The goal of this paper is to define the surface topography and optical properties of thin films NiPc/PTCDA blends prepared with different proportions of components and parameters of evaporation process.



The Manufacturing and processing area is shown in the paper on "Surface layers on the Mg-Al-Zn alloys coated using the CVD and PVD methods" by T. Tański on a **page 89**. The aim of this paper was to investigate structure and properties of gradient coatings produced in PVD and CVD processes on MCMgAl9Zn1 magnesium alloys. The deposited coatings are characterised by a single, double, or multi-layer structure according to the applied layers system, and the individual layers are coated even and tightly adhere to the substrate as well to each other. The analysis of coatings obtained on the surface of cast magnesium alloys by the PVD and CVD processes show a clear – over 100% – increase of the microhardness, compared to the base material microhardness. The best results of the sliding distance were obtained for the DLC coatings. The paper presents the research involving the PVD and CVD coatings obtained on an unconventional substrate such as magnesium alloys. Contemporary materials should possess high mechanical properties, physical and chemical, as well as technological ones, to ensure long and reliable use. The above mentioned requirements and expectations regarding the contemporary materials are met by the non-ferrous metals alloys used nowadays, including the magnesium alloys. Achieving new operational and functional characteristics and properties of commonly used materials, including the Mg-Al-Zn alloys is often obtained by heat treatment, ie, precipitation hardening and/or surface treatment due to application or manufacturing of machined surface layer coatings of materials in a given group of materials used for different surface engineering processes.

Manufacturing and processing