



59. PEDOT:PSS thin film for photovoltaic application

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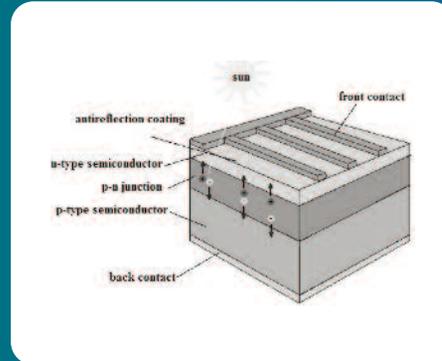


67. Electrical properties mono- and polycrystalline silicon solar cells

L.A. Dobrzański, M. Szczęśna, M. Szindler, A. Drygała (Poland)

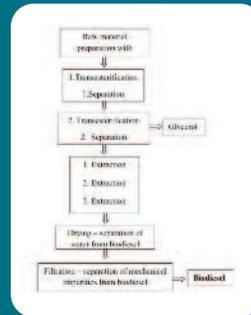
75. Impact of residual glycerides on viscosity of biodiesel (waste and rapeseed oil blends)

L.A. Dobrzański, M. Szczęśna, M. Szindler, A. Drygała (Poland)



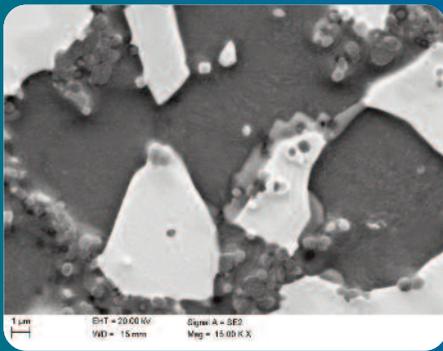
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The Properties section represented by L.A. Dobrzański, M. Szczęśna, M. Szindler and A. Drygała on “Electrical properties mono- and polycrystalline silicon solar cells” on a **page 67** presents the properties of mono- and polycrystalline silicon solar cells. It was based on measurements performed of current-voltage characteristics and calculated parameters using mathematical formulas. Light and dark current-voltage characteristics of solar cells were measured using a solar simulator PV Test Solutions company SS150AAA model. The measurements were performed under standard conditions ($P_{in} = 1000 \text{ W/m}^2$, AM1.5G spectrum, $T = 25^\circ\text{C}$). The basic characteristics of the solar cells were determined using the software SolarLab and calculated using mathematical formulas. Results and their analysis allow to conclude that measurements of current-voltage characteristics enable characterization of the basic parameters of solar cells. Important information about the property of prepared metallic contacts on the solar cells can be given. Knowledge about the current-voltage characteristics of solar cells and their basic parameters enables the assessment of the quality of their production and the improvement.



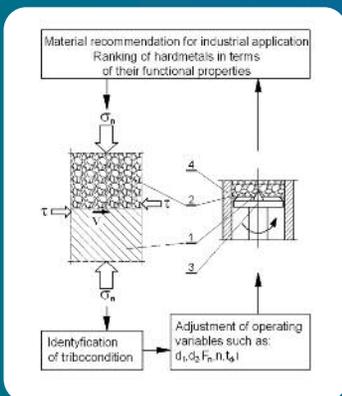
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In the research paper entitled “Impact of residual glycerides on viscosity of biodiesel (waste and rapeseed oil blends)” by Z. Jurac and L. Pomenić on a **page 75** the influence of residual glycerides on kinematic viscosity of biodiesels produced from the various waste cooking oils and crude rapeseed oil blends is presented. Biodiesel, mixture of fatty acid methyl esters is a biodegradable alternative fuel that is obtained from renewable sources as vegetable oils or animal fats. Use of waste cooking oils reduce the cost of raw materials for biodiesel production and also reduces the environment pollution. Moreover, pure edible vegetable oils for biodiesel production have an ethical significance because food is used to produce fuel. The aim of this work is a presentation of effects that residual glycerides have on kinematic viscosity values of biodiesels produced from the various waste cooking oils with crude rapeseed oil blends. Kinematic viscosity is one of the most important property of biodiesel and it directly depend on raw material composition. This article includes analysis and estimation of the effect that residual mono-, di- and triglycerides which remain in the biodiesels after transesterification processes have on their kinematic viscosities. Results obtained for biodiesel produced from various percentages of waste cooking oils and crude rapeseed oil blends were presented. These presented results are the closed solution considering the used raw materials. Quality and chemical composition of the used waste cooking oils are quite different from each other, which affects the quality of the produced biodiesels. Because of that these results should be an indicator for the further testing and improvements to achieve optimization of transesterification process which can reduce the amount of the residual glycerides in the biodiesel. The results presented in the paper can be applied in the industry for estimation and selection of the optimal percentages of waste cooking oils and crude rapeseed oil blends for the biodiesel production.



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Authors: G. Matula, A. Jędrzejewska-Anioł and J. Niespodziański in the paper entitled "Application of powder injection moulding for manufacturing of tool composite materials" on a **page 80** presents development of the tool composites on the basis of T15 HSS contained 10% of carbides. This tool material were manufactured by Powder Injection Moulding method and sintered. Examination of the effect of the binder type and portion on structure and properties of the experimental tool materials revealed that using the stearic acid for covering the carbides surface reduces viscosity, thus improving technological properties of the feedstock. Employment of polypropylene instead of the high density polyethylene reduces viscosity and torque-load of the investigated feedstocks. Therefore, there is a possibility to increase the portion of the metallic and ceramic powder. Stearic acid significantly reduces the viscosity of tested polymer-powder mixtures, so its use is justified. The share of the binder in materials, injection molded or extruded should be minimal and allows only the formation of the slurry. Too high proportion of binder creates difficulties during the degradation and causes greater shrinkage and possibility of a distortion during sintering. Employment of polyethylene instead of the high density polypropylene reduces viscosity and torque-load of the investigated feedstocks. Therefore, there is a possibility to increase the portion of the metallic or ceramic powder. This results in a lower deformation probability and in a lower sinter shrinkage. In the paper the using extruding of the polymer-powder mix gives the possibility to fabricate cermetes which, with their structure and mechanical properties, fill the gap in tool materials between the high-speed steels and cemented carbides.



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The research paper entitled "Hardmetals characterization by tribological means" by S.F. Ścieszka, W. Grzegorzek and M. Żoźnierz on a **page 86** presents the following objectives: firstly, the presentation of new and reliable integrated testing method, in which conjoin action involving fracture and abrasion of hardmetals is carefully monitored and analysed, and secondly, the evaluation of the empirical relationship between mass loss as a result of edge chipping during the initial transition stage of abrasive wear and fracture toughness in the form of formula. The tests were performed in a purpose-built testing machine. The apparatus consists of the disc rotating in the cylindrical chamber under normal force. The specimen bars, made from the hardmetals are attached to the upper side of the disc. The results from this testing show that by using one apparatus and one shape of the test specimen it is possible to obtain a reliable rating of hardmetals. The integrated testing method required a theoretical or empirical model which describes the relationship between fracture toughness, other mechanical properties and the test's fracture indicator. The best received correlation was for empirical model based on study on abrasive wear by lateral cracking. The proposed method offers advantages when used in hardmetals development programmes to rank a large number of materials in terms of abrasion and fracture resistance.



80. Application of powder injection moulding for manufacturing of tool composite materials

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86. Hardmetals characterization by tribological means

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