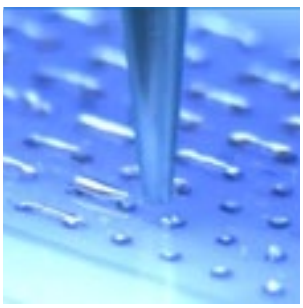
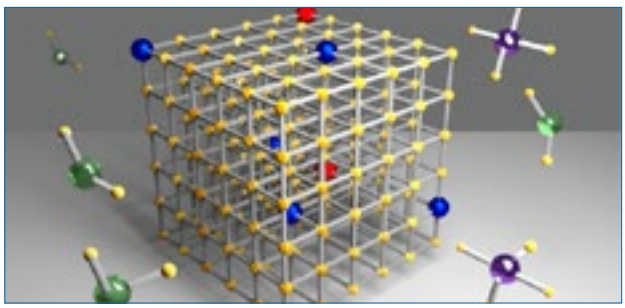
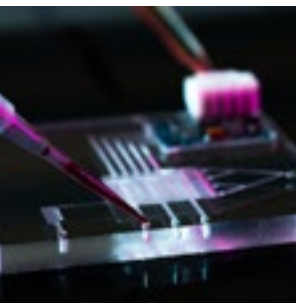
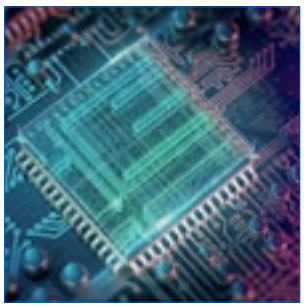
Poster Presentation

Nanotechnology 2022



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Artificial neural network model for modeling the fixed bed adsorption of tartrazine dye from aqueous solution

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In this work an artificial neural network (ANN) was used as an intelligent artificial approach and developed to predict the dynamic adsorption (fixed bed adsorption) of tartrazine dye which is a dye on actived carbon which is a material using as an adsorbent under different conditions. eight inputs (time, area surface, particle diameter, mass of adsorbent, apparent density, molar mass, initial concentration and flow rate) corresponding to eight neurons were used in the input layer, ten neurons in the hidden layer and one in the output layer for the reduced concentration. For the learning, a Levenberg Marquardt back-propagation algorithm was applied. The tangent sigmoid and linear transfer functions are used for the hidden layer and the output layer respectively. The results showed a high correlation coefficient R2=0.9983 between experimental and estimated data. The error between experimental and predicted data in terms of root mean square error RMSE is very minimal equal to 0.012. These results provide the high capacity of ANN to store experimental data and to describe the dynamic adsorption phenomena.

Recent Publications

1. Sediri Meriem, Hanini Salah. Wastewater treatment by adsorption process on mineral actived carbon: modeling and prediction using an intelligent artificial approach. IOP Conf. Ser.: Mater. Sci. Eng. 2021; 1204(1): 012006

2. Asma Adda, Salah Hanini, Mohamed Abbas, Meriem Sediri. Novel adsorption model of filtration process in polycarbonate track-etched membrane: Comparative study. Environmental Engineering Research. 2020; 25(4): 479-487

3. M Sediri, S Hanini, H Cherifi, M Laidi, S Abbas Turki. Dynamic Adsorption Modelling of P-nitrophenol in Aqueous Solution Using Artificial Neural Network. J. Mater. Environ. Sci. 2017; 8(7): 2282-2287.

Speaker Biography

Sediri Meriem is a doctor and lecturer in process engineering of Higher Education at university of Médéa, Algeria. She is a member in Biomaterials and Transport Phenomena laboratory, her field of research interests of Application of cognitive science for the modeling and optimization of processes, Application of software as artificial computational intelligence for process design, Modeling and control of chemical processes, Transport phenomena, Environment and treatment of effluents. She has published articles in different journal indexing by Thomson Reteurs and Scopus.

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Hydrogen incidence on tensile strength behavior of AISI 316L stainless steel

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Most paper in literature are devoted on the effect caused by chromium carbides on the tensile behaviour of stainless steels, for example, it is known that the precipitation of M23C6, M6C and sigma phase are harmful under certain operative conditions, although there are only few papers related with hydrogen embrittlement in type 316L stainless steels. Even though hydrogen slightly modifies the mechanical behaviour of these stainless steels, it should be considered to avoid significant economic losses. The aim of this work is to evaluate the effect on mechanical response of hydrogen charged AISI 316L stainless steel samples. To achieve homogeneous carbides precipitation, specific thermal treatments were conducted on as-received samples. Then three sets of samples were considered to carry out tensile tests. Before that, a group of heat-treated samples were hydrogen charged, in a 1N H2SO4 electrolytic solution with 0.25 g/L NaAsO2 as hydrogen promoter agent, using graphite anode and a constant current density of 35 mA/cm2 for 3.5 h. After tensile tests, the resulting fracture surfaces exhibited mixed ductile-brittle behaviour in hydrogen charged samples in comparison with the ductile morphology obtained in uncharged ones. In addition, in hydrogenated samples cracks were found associated with fine chromium carbides, while ductile well-developed dimples were found in uncharged samples. In coincidence, there was a ductility loss in electrolytic hydrogen charged samples, which was not observed in those uncharged ones. In order to identify hydrogen- carbides interactions, a selective metallographic technique made it possible to find grain boundaries and carbides/matrix interfaces as the main hydrogen traps. Furthermore, differential scanning calorimetry (DSC) tests were performed to obtain hydrogen desorption temperatures. Results allowed to settle that those carbides developed during thermal treatments are responsible for deleterious hydrogen trapping that may cause mechanical failure on AISI 316L stainless steel.

Recent Publications

1. M N Delpupo, M N Inés, C A Asmus, G A Mansilla. Estudio del ingreso de hidrógeno en acero electrocincado mediante análisis térmico. Avances en Ciencias e Ingeniería. 2020; 11(3): 71-79

2. Graciela A Mansilla, Mariano N Inés, María Noelia Delpupo. Analysis of hydrogen behavior in high strength steels joints welded by smaw. Recent advances in welding. 2020

3. María N Delpupo, Mariano N Inés, Graciela A Mansilla. Influence of electroplating stages on hydrogen pickup in SAE 1005 steel. Advanced Materials Proceedings. 2018; 3(5): 356-360.

Speaker Biography

Mariano N. Inés, was born in the year 1985, he received his Metallurgical Engineer degree at the National Technology University of San Nicolas (UTN-FRSN), Argentina. He is currently professor and researcher at the UTN-FRSN, Argentina. His work area is related with hydrogen embrittlement of steels and its alloys. Currently he is working on his PhD in engineering at the Physical Metallurgy Laboratory of the UTN-FRSN.

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Effects of Y and Gd on creep properties of hot-rolled Mg-1Zn-1.5Y-3.75Gd

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Bangladesh University of Engineering and Technology, Bangladesh

Magnesium alloys containing rare earth elements has received appreciable consideration owing to greater strength from precipitation hardening, in addition to high strength to weight ratio and better fuel economy from the lightest structural metal - magnesium. In this work, creep properties of Mg-1%Zn-1.5%Y-3.75%Gd alloy were investigated at different temperatures such as 250, 300, 350 and 400°C. The addition of rare earth elements like such as yttrium (Y) or gadolinium (Gd) has improved strength from significant contribution to solid solution strengthening and precipitation strengthening. Optical microscopy revealed the larger grain size in the as-cast and homogenized condition, which were notably reduced by dynamic recrystallization during hot rolling at 370°C. Thermal stability of the phases were studied using heat flow patterns in Differential Scanning Calorimetry. Micrographs of Scanning Electron Microscopy (SEM) were analysed to calculate the extent of precipitation size and shape in image analysis processing software package. Precipitation kinetics were precited using CALPHAD method with the support from KWN Model. It was expected that a long-period stacking ordered (LPSO) phase contribute significantly to high temperature strength of the material. Presence of LPSO phase would refine the grains and twinning did not act as nucleation site.

Recent Publications

1. H M M A Rashed, M A Islam, F B Rizvi. Effects of process parameters on tensile strength of jute fiber reinforced thermoplastic composites. Journal of Naval Architecture and Marine Engineering. 2006; 3(1): 1-6

2. N Nafsin, H M M A Rashed. Effects of Copper and Magnesium on Microstructure and Hardness of Al-Cu-Mg Alloys. International Journal of Engineering and Advanced Technology. 2013; 2(5): 533-536

3. Hossain M M A Rashed. Control of Distortion in Aluminium Heat Treatment. Fundamentals of aluminium Metallurgy. 2018; 495-524.

Speaker Biography

H M Mamun Al Rashed is an Asstt. Prof, BUET from 2011 till date. Previously he was a Lecturer at BUET from 2001-2011. He completed his Ph.D. in Material Science in the year 2010 at University of Manchester, UK. He was Awarded HEQEP Sub-project in 2014. CP No. 3117, titled "Development of facilities to study hot deformation behavior of steel and light alloy materials". Duration: July 2014 -June 2016. He organised and coordinated a seminar on "Impact of quality of steel in Civil Engineering applications". He is working as a reviewer for many journals like Journal of materials science and engineering applications, Materials science & Materials engineering, Journal of materials science, Materials letters, Elsevier and more.

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Accepted Abstracts

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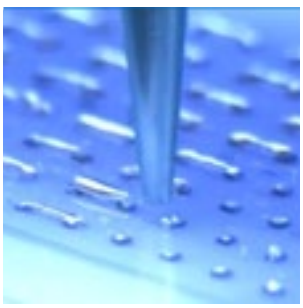
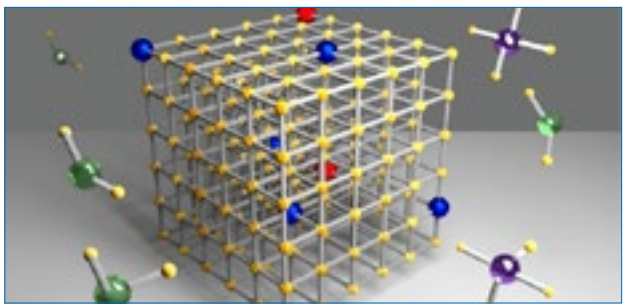
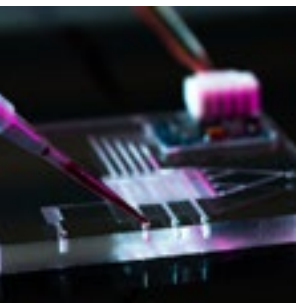

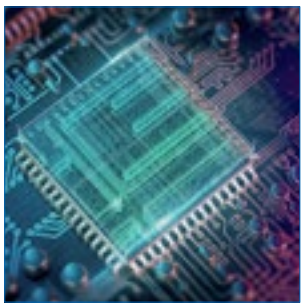

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Optimization of the electrical conductivity of copper phthalocyanine for the formulation of a conductive ink applicable by screen printing on textile materials

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[2]REMTEX, Morocco

We report results on the conductivity of conductive ink based on copper phthalocyanine, which contain different organic solvents, i.e. dimethylsulfoxide (DMSO) or THF and with different percentage of copper phthalocyanine. Conductive inks were prepared from the copper phtaloyanine by dispersion of the conductive pigment in a screen printing paste. A Variety of patterns have been developed with different percentages of CuPc on a cotton substrate using the screen printing technique. Simultaneously, the presence of solvent residue in the printed pattern also resulted in poor control of the morphology and conductivity of the pattern. The solvent effect on copper phtalocyanine dispersion's was studied by UV visible spectroscopy and the minimum sheet resistance of printed circuit board was reached at about 3% of CuPc in THF and DMSO with 1 MΩcm and 1.8 MΩcm respectively.

Recent Publications

1. Omar Cherkaoui, Marwane Rouway, Mostapha Tarfaoui, Nabil Chakhchaoui, Lhaj El Hachemi Omari, Fouzia Fraija. Additive Manufacturing and Composite Materials for Marine Energy: Case of Tidal Turbine. 3D Printing and Additive Manufacturing. 2021

2. Omar Cherkaoui, Ahmed Abed, Zineb Samouh, Cédric Cochrane, Francois Boussu, Reddad El Moznine, Julien Vieillard, et al. Piezo-Resistive Properties of Bio-Based Sensor Yarn Made with Sisal Fibre. Sensors. 2021; 21(2): 4083

3. Omar Cherkaoui, Hassan Suiffi, Anas El Maliki, Mohamed Dalal. Study of the durability of concrete mixed with polypropylene fibers. Procedia Structural Integrity. 2021; 33: 229-236.

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