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Mohammad Hassan et al., J Environ Geol. | Volume 3
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Thin-film membranes made from rice straw nanofibers isolated from high-lignin neutral sulfite pulp and bleached sulfite pulp

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There is an increasing interest during last years in isolating cellulose nanofibers from unbleached cellulose pulps due to economic, environmental, and functional reasons. In the current work, cellulose nanofibers isolated from unbleached neutral sulfite pulp (RSNF) were compared to those isolated from bleached neutral sulfite pulp in making thin-film ultra-filtration membranes by simple vacuum filtration on hardened filter paper. The prepared membranes were characterized regarding their microscopic structure, hydrophilicity, pure water flux, fouling, and removing lime nanoparticles and oil from oil-in-water emulsion. Using cellulose nanofibers isolated from unbleached pulp resulted in easier formation of thin-film membrane (shorter filtration time) and higher water flux than in case of using nanofibers isolated from bleached fibers, without sacrificing its ability to remove the lime nanoparticles or oil from its emulsion.

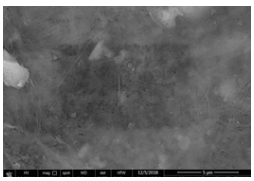

Figure 1: SEM image of membrane surface made from unbleached RSNF.

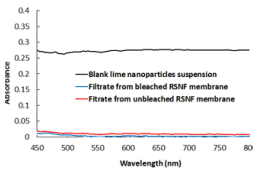

Figure 2: Visible absorption spectra of blank lime nanoparticles suspension and filtrate after passing through the membrane

Biography

Mohammad Hassan has expertise and interest in nanocelluloses and their isolation technologies,bionanocomposites, and their applications is areas related to membranes for water treatment, tissue engineering, drug release systems, paper making, flexible electronics, packaging, and conservation of heritage.

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Lamia Ben Amor et al., J Environ Geol. | Volume 3
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Exploring the determinants factors of recycling rate: An analysis for the plastic waste in Tunisia

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This research paper aims to examine the influence of financial (Price of Waste Disposal), institutional (Collection of waste, Drop- off recycling centers, Ordinance) and demographic determinants (Population Density) on recycling rate of plastic as a domestic waste on a Panel of 24 governorates from Tunisia Country using a static model estimated by the Ordinary Least Squares (OLS) over the 2001- 2018 period. We also implement this empirical model for 24 governorates from only country selected on the base data availability. They include *Ariana, Beja, Ben Arous, Bizerte, Gabes, Gafsa, Jendouba, Kairouan, Kasserine, Kebili, Kef, Mahdia, Manouba, Medenine, Monastir, Nabeul, Sfax, Sidi-Bouzid, Siliana, Sousse, Tataouine, Tozeur, Tunis, and Zaghouan*. It is concluded from empirical findings that all exogenous variables expect population density have significant effect on recycling rate. Consequently, this is a great improvement in the Tunisia environmental system of waste management.

Biography

Lamia Ben Amor has her expertise in evaluation and passion in improving the environment and during of sustainable development. Her open and contextual evaluation model based on responsive constructivists creates new pathways for improving the sector of recycling. She has built this model after years of experience in research, evaluation, visiting environmental institutions and exploring several places of reusing and recycling waste. The foundation is based on fourth generation evaluation (Kinamman and Fullerton,1996) which is a methodology that utilizes the previous generations of evaluation: measurement, description and judgment. It allows for value-pluralism. This approach is responsive to all stakeholders and has a different way of focusing.

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Mimic of collagens properties by creating sacrificial bonds on synthetic polymer

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Sacrificial bonds and hidden length confer on hard and dry natural materials, high strength, stiffness, toughness, and self-recovery of its function in response to successive mechanical stimulation at the molecular scale. This type of links is involved in complex hierarchical structures, such as bone, tendons, ligament, nacre, mussels… These natural materials have high toughness. It has excellent mechanical properties as well as remarkable self-regenerative properties, like self-healing behavior 1,2, which arises in part from secondary sacrificial bonds between chain segments in coiled organic phase.

In the last ten years there have been many important advances in the development of self healing polymers 3-11 and polymer Nanocomposites. Biomimetics12-16 aims to reproduce some of the properties of natural structural materials, using rationally engineered and scalable components and processes.

The understanding of the functioning and the principle of the forming mechanism of sacrificial bond (Sb) is of significant fundamental interest. Indeed, this phenomenon governing interactions at the molecular level of different natural materials (bones, skin, tendons, abalone, toils of Spider, pearl ....) Is not yet fully elucidated well.

In this work we looking for mimic of the collagen fiber with creating Sb on individuals poly(Acid-Acrylic) (PAA) chains. We present the results of dynamic force spectroscopy experiments conducted on individuals PAA chains, which were Immersed in a physiological buffer. Through these experiences, the hidden length and the strength of the rupture of Sbs Were Measured, in function of loading rates. A clear scheme of formation of Sbs was revealed, and The energy released by their rupture was quantified.

These results made it possible to understand the role played by these bonds in the mechanical properties at the molecular level.

Biography

Sadia Radji is an Associate Professor in Department of Physics at the University of Pau and the Adour / IPREM-EPCP countries. Before joining University of Pau and the Adour, she worked as Contract of temporary teaching and research assistant (ATER), in Department of Physics, at University of Nantes. From October 2006-November 2009 she did her PhD thesis in Physics of Materials. Jean Rouxel Materials Institute (IMN). Her research interests include Structural properties of materials at nanoscale and molecular scales.

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Nadezhda V Vernikovskaya, J Environ Geol. | Volume 3
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A modelling approach to deal with the particulate matter pollutants: Filtration of diesel soot and suspensions

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In the modern world, there is always a huge amount of solid waste caused by human life and harmful to nature and people. Solid waste may be small particles in a liquid or gas mixture. Filtration processes can be used to capture these particles from mixture in order to reuse them or simply to reduce their content in the mixture being cleaned. Mathematical modeling of filtering processes can help reduce experimental efforts during filtration processes development. The purpose of the study was to develop an Equation-Oriented approach to modeling filtration processes, the aim of which is to reuse trapped particles and / or reduce the content of particles in the mixture being cleaned.

The approach is to create a model of the necessary and sufficient degree of complexity, to develop an effective algorithm for solving model equations and create a program code. The model takes into account the main necessary features of the system: unsteady-state behavior, geterogeneity of the system, convective mass transfer of particles in mixture along the filter depth, penetration of particles through the filter, accumulation of particles inside the filter pores, deposition of coarse particles and particles due to inertial collision on the outer filter surface, particles size distribution. A sufficient degree of complexity is the use of one-dimensional models, since the transfer of particles occurs only in one direction.

The algorithm is based on the three existing methods and takes advantages of each of them: the method of lines, the running scheme, and the second order Rosenbrock method with stepsize adjustment algorithm.

The approach has been applied to the modeling of such filtration processes as soot particulates abatement in diesel engine exhaust and filtration of the catalysts suspension in hydrogenated oil through the woven cloth. Verification of the mathematical model and numerical method is done by means of comparison of the numerical results with the experimental data.

Using this approach to modeling various filtering processes it is possible to predict the performance of filters and to select the filtering material with the proper specifications for efficient reducing particle content in the mixture being cleaned. The captured solids can be then reused if necessary.

This work was conducted within the framework of budget project No. 0303-2016-0017 for Boreskov Institute of Catalysis.

Biography

Nadezhda V Vernikovskaya is senior researcher at Boreskov Institute of Catalysis SB RAS (BIC SB RAS), Novosibirsk, Russia, Associate Professor, Faculty of Natural Sciences, Novosibirsk State University (NSU) and Associate Professor, Aircraft Faculty, Novosibirsk State Technical University (NSTU). She has completed her PhD in 1996. She has written approximately 100 peer reviewed journal articles, book chapters and conference papers. Most of her research has focused on modeling and simulation of such heterogeneous catalytic reactors as tubular reactor, fluidized bed reactor, structured catalytic reactor and so on; soot particulates abatement in diesel engine exhaust by their trapping in filters; filtration of the catalysts suspension in hydrogenated oil through the woven cloth.

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High performance supercapacitor based on layerd polypyrrole/graphene oxide on polypyrrole/manganese oxide

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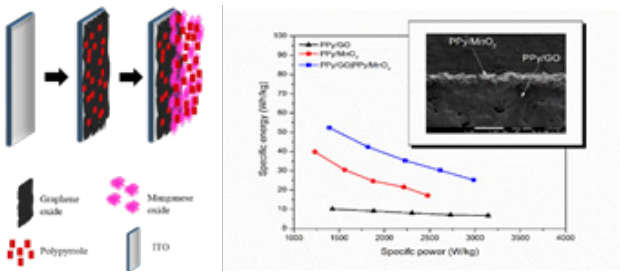
Supercapacitors possess significant advantages compared to other energy storages due to its fast charging and discharging, long cycle life, low cost and good environmental friendliness. In this work, a layer-by-layer (LBL) of polypyrrole/graphene oxide and polypyrrole/manganese oxide (PPy/GO|PPy/MnO2) was prepared via a facile electrochemical deposition. The field emission scanning electron microscopy (FESEM) image clearly showed that PPy/MnO2 was uniformly deposited on PPy/GO. The PPy/GO|PPy/MnO2 LBL composite displayed a high specific capacitance of 786.6 Fg-1 compared to its individual single layers with superior specific energy of 52.3 Wh kg-1, specific power of 1392.9 W kg-1 and good cycling stability over 1000 cycles. The remarkable supercapacitive performance was contributed by the synergistic effect between each material proving an outstanding candidate electrode material for supercapacitor.



Biography

Yusran Sulaiman is working at the Department of Chemistry, Universiti Putra Malaysia (UPM). He is also an Associate Researcher at Functional Device Lab in Institute of Advanced Technology, UPM. His current area of research includes preparation of conducting polymers and nanomaterials-based materials for sensing platforms, energy storage and solar cells. He is a very competent and innovative researcher and he has obtained several awards such as IAAM Scientist Medal (2018), Vice Chancellor Fellowship Award 2017 (UPM), Early Career Chemist International Congress of Pacific Basin Societies (Pacifichem 2015), from American Chemical Society and Young Investigator Award 2015, Young Scientist Network Malaysia and Akademi Sains Malaysia.

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Effect of gamma-radiation on thermal ageing of butyl rubber compounds

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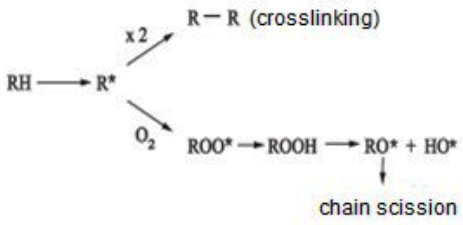
Butyl rubber has a comprehensive use in sealing systems, especially in tires inner tubes, due to their low permeability to gases. So, it is required that butyl rubber compounds show a better performance, more and more. Butyl rubber is provided with excellent mechanical properties and oxidation resistance. Besides showing these properties, radiation exposures impart modifications in physical-chemical and morphological properties on butyl rubber materials. When exposed to gamma-radiation, rubbers suffer changes in their mechanical and physical properties, caused by material degradation. The major radiation effect in butyl rubbers is chain- scission; besides, ageing promotes too the same effect with further build- up of free radicals. This work aims to the study of gamma-radiation in physical-chemical properties of butyl rubber subjected to thermal ageing. Doses used herein were: 25 kGy, 50 kGy, 100 kGy, 150 kGy and 200 KGy. Samples were evaluated before and after ageing according to traditional essays, such as: hardness, tensile strength and elongation at break. From accomplished assessments, it is possible to affirm that at doses higher than 50 kGy it was observed a sharp decreasing in butyl rubber physical-chemical properties, before and after exposure to ageing.



Biography

Sandra Regina Scagliusi: Great experience with elastomers. Upgraded in recovering of rubbers, in general, specially dealing with butyl and halo-butyl rubbers (chlorine and bromine). She is deeply involved with irradiation, recycling, de- vulcanization, micro-wave. She developed a new process of rubbers recovering via radiation and mechanical shear. She has been dedicating in research toward environmental area in recycling of solid materials and elastomers. Proved experience in research and quality control laboratories.

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