DAY 1

Keynote Forum

World Congress on

Materials Science & Engineering

August 23-25, 2018 Amsterdam, Netherlands

EuroSciCon

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Stoyan Sarg Sargoytchev, Nano Res Appl 2018, Volume: 4
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ANALYSIS OF LENR AND RECOMMENDATIONS FOR COLD FUSION ENERGY USING THE BSM-SG ATOMIC MODELS

Stoyan Sarg Sargoytchev
World Institute for Scientific Exploration, USA

The fast growing branches of nanotechnology permitted advancements in different fields. Among them is the recent success in Low Energy Nuclear Reactions/Lattice Enabled Nanoscale reactions (LENR). This requires a new theoretical understanding for processes in atomic sub-nanometric scale. The atomic models derived in the Basic Structures of Matter Supergravitation Unified Theory (BSM-SG), denoted as the BSM-SG models, fit quite well to this need. The BSM-SG theory reveals the existence of a space microcurvature surrounding the elementary particles and the super dense atomic nuclei. This explains why quantum mechanical models work only with energy levels and not with the dimension of length. The re-examination of scattering experiments from the BSM-SG point of view reveals a complex three-dimensional nuclear structure different from the quantum mechanical models of atoms based on the Bohr atomic model. Protons and neutrons are not point-like; the atomic nuclei have a much larger overall size, so the Coulomb barrier is not so strong. Therefore, some nuclear transmutations are possible at accessible temperatures. The pattern of the Periodic Table carries a strong signature of the spatial arrangement of protons and neutrons in the atomic nuclei. Nuclear stability depends on the symmetrical arrangement of protons and neutrons. Nuclear spin and nuclear magnetic resonance are also identifiable features of the nuclear configuration. The BSM-SG atomic models provide a new opportunity for analysis and prediction of many nuclear transmutations in the field of LENR. This issue is presented in the author's book 'Structural Physics of Nuclear Fusion'. The book describes a new method for theoretical estimation of the binding nuclear energy based on the derived nuclear dimensions of hadrons and derived strong force parameters. This provides new considerations for the proper selection of isotopes suitable for realization of cold fusion energy with minimal or no radioactive waste.

Biography

Stoyan Sarg Sargoytchev completed his PhD in Physics from the Bulgarian Academy of Sciences in 1984. Until 1990, he worked on space research projects coordinated by the program Intercosmos, and on a project of the ESA European agency. From 1990 he was a Visiting Scientist at Cornel University for two years. From 1992 he worked with Canadian government institutions and universities and retired from York University in 2013. Currently he is a Distinguished Scientific Advisor at the World Institute for Scientific Exploration, (WISE), USA. Selected articles: http://vixra.org/author/stoyan_sarg.

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BASIC PROPERTIES OF MYOSIN HEAD POWER AND RECOVERY STROKES AS REVEALED BY EXPERIMENTS USING THE GAS ENVIRONMENTAL CHAMBER

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Although more than 50 years have passed since the discovery of the sliding filament mechanism in muscle contraction, molecular mechanism of myosin head power and recovery strokes still remains to be a mystery. Using the gas environmental chamber (EC) attached to the transmission electron microscope, we have succeeded in visualizing and recording myosin head power and recovery strokes in individual myosin heads, coupled with ATP hydrolysis. The results hitherto obtained are summarized as follows: (1) In the absence of actin filaments and ATP, myosin heads fluctuate around a definite neutral position, so that time-averaged myosin head position remains unchanged with time; (2) On ATP application, myosin heads move away from, but not towards, the bare region at the center of myosin filaments, indicating myosin heads perform recovery stroke; (3) The average amplitude of the recovery stroke is ~6 nm; (4) In the presence of actin filaments, myosin heads perform power stroke by stretching adjacent elastic structure due to a limited amount of ATP applied; (5) The average amplitude of power stroke is 3.3 nm at the distal region, and 2.5 nm at the proximal region of myosin head catalytic domain; (6) In both power and recovery strokes, myosin heads return to their neutral position after complete exhaustion of ATP applied, indicating that myosin heads (M) can take three definite positions, i.e., neutral, post-power stroke, and post recovery stroke positions, the transition between them is associated with reaction, M-ATP M-ADP-Pi. We emphasize that our EC experiments are extremely promising, if coupled with the methods of laser flash photolysis of caged ATP and time-resolved electron microscopy.

Biography

Haruo Sugi has completed his PhD from the University of Tokyo in 1962, and worked in the University of Tokyo, Columbia University and National Institutes of Health. He was Professor and Chairman in the Department of Physiology, School of Medicine, Teikyo University from 1973 to 2004 and when he became Emeritus Professor, from 1998 to 2008, he was Chairman of Muscle Committee in the International Union of Physiological Sciences (IUPS).

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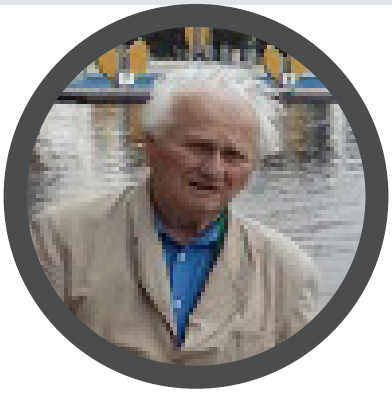
NEW CARBON BASED MATERIAL OBTAINED BY γ QUANTA IRRADIATION WITH THRESHOLD ENERGY OF 10MEV OF PURE GASEOUS HE, UNDER HIGH PRESSURE, IN CUBE2 APPARATUS, PHYSICAL PROPERTIES AND ASPECTS OF NEW NANOTECHNOLOGY



Roland Wisniewski[1], Gennady V Mishinsky[2] and Teresa Wilczynska-Kitowska[3]

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[2]Joint Institute for Nuclear Research, Russia
[3]National Centre for Nuclear Research Otwock-Swierk, Poland

The paper presents, observed by authors, some physical properties and possible crystallographic structure of the carbon rich (graphite-like) elements which were found in the high pressure chamber (HPC) fulfilled before gamma irradiation only by pure gaseous helium under pressure (1 – 3) kbar. A helium HPC filled up with pure gaseous helium at initial pressure about 1.1 kbar was irradiated by braking γ-rays of 10 MeV threshold energy during 1.0•105 s at the electron beam current (22-24) μA. After irradiation, the residual pressure inside was much lower and equal to 430 bar. Synthesized of macroscopic amount foils of black color and of 0.22 mm thickness and other multiple objects were found inside the HeHPC. The element analysis, using scanning electron microscopy (SEM) and microprobe roentgen analysis (MPRA), allowed us to establish that the foils consist predominantly of carbon and oxygen and smaller quantities of other elements (tentative weight % content: 60% C, 30% O, 3% Mg, 2% N, 0.14% Si...). Two years later some physical properties such as low density (1.20±0.20 g/cm3), high resistivity (more than E5 micro ohm m), high paramagnetic properties and medium dielectric relative constant were determined. Mechanical compressive strength to be of order of 10 MPa was noted. Temperature investigation pointed out its melting temperature to be no higher than 4000C. A new carbon-reach structure (graphite–like, with typical carbon graphite planes and with oxygen, magnesium and so on atoms between) was also postulated based on obtained diffractometer data (using Siemens D500 powder diffractometer, equipped with high-resolution Si semiconductor detector). Also the second method for element content determination (EDX), in principle, has confirmed the previous one. The theory of observed phenomenon was based on postulated so called transnucleus phenomenon which took place in dense helium irradiated by proper gamma rays. Multinuclear reaction in irradiated condensed helium seems to be a new macro, micro technology.

Biography

Roland Wiśniewski has received his AB degree, in Mechanical Construction from Warsaw University of Technology (WUT), in 1956. Has started to work at WUT in 1952, has completed his PhD at the Electronics Faculty of WUT in 1964. He was Deputy Professor from 1974 and Full Professor from 1983 in Physics Faculty of WUT, Retired Professor since 2001. He headed a research group on High Pressure Physics and Technology (from 1956) and in Nuclear Physics (2000 - 2014) as Professor at National Center for Nuclear Research (PL), cooperating with Joint Institute for Nuclear Research (Dubna, RF). He has been Author (or Co-author) of over 250 published papers in scientific and technology journals, has 30 applied patents, has presented in 50 international Conferences and was Supervisor of 9 thesis (PhD degree). He was awarded by the Cavalier Cross of the Rebirth of Polish Order, by the National Education Commission Medal and by others.

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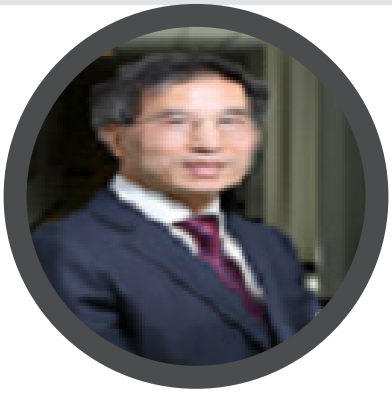
ENAMEL COATING FOR STEEL REBAR IN CONCRETE: CORROSION BARRIER AND BOND ENHANCER

Genda Chen
Missouri University of Science and Technology, USA

This paper summarizes the corrosion resistance and bond strength of coated and uncoated steel reinforcing bars in mortar or concrete. Coatings investigated included pure enamel (PE) for corrosion protection, calcium silicate modified enamel (ME) for bond enhancement, and double enamel (DE) with an inner layer of PE and an outer layer of ME. For comparison, fusion-bonded epoxy (EP) was also considered. For corrosion performance, mortar cylinders reinforced with uncoated (UN) and PE-, ME-, DE-, and EP- coated steel bars were immersed and tested in 3.5 wt% NaCl solution. The corrosion evolution was monitored using electrochemical impedance spectroscopy (EIS). The increase in corrosion resistance was as high as 100 times and 4 times when the steel bar was coated with PE and ME, respectively. Due to chemical bond between the enamel and steel, the corrosion of damaged PE-coated bars was confined to damage areas with no under-film corrosion as observed with EP coating. For bond behaviour, pull out specimens were prepared with one steel bar placed along the center line of each mortar cylinder. The effects of mortar curing time (28 days and 60 days) were investigated. The PE-coated steel bars were also tested in large-scale reinforced concrete (RC) columns under cyclic loads and in full-scale RC walls under blast loads to understand how the bond improvement of enamel coating at material level was translated to the performance of structural systems. The bond strength can be increased by 2 times and 7 times when a steel bar is coated with PE and ME, respectively. The significant steel-concrete bond increase with ME resulted from the increased surface roughness and the chemical bonding of embedded calcium silicate particles in surrounding mortar. With enamel coating, the failure modes of RC columns and walls can be changed from brittle to more ductile behaviour.



Biography

Genda Chen has received his PhD in Civil Engineering at State University of New York at Buffalo. He is Professor and Robert W Abbett Distinguished Chair in Civil Engineering, and Director of the federal-funded, five-year INSPIRE University Transportation Center at Missouri University of Science and Technology. He is an Associate Director of the federal-funded, five-year Mid-America Transportation Center headquartered at the University of Nebraska, Lincoln. He has published more than 150 papers in reputed journals in the field of interface mechanics and deterioration, structural health monitoring, structural control, and multi-hazard assessment and mitigation. He has been serving as an Associate Editor of the *Journal of Civil Structural Health Monitoring*, a section Editor of *Sensor*, and an Editorial Board Member of 5 reputed journals.

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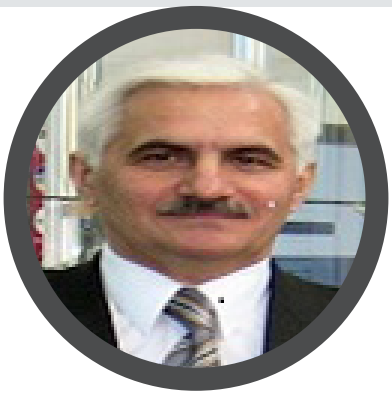
NANOSTRUCTURED COMPOSITE COATING ORIENTANTS IN TRIBO-ENGINEERING



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The work given briefly in report is on the history synthesis of new type nanocomposite with carbon materials having no analogues till now, which provides essential reducing of power losses in lubricated tribounits. Efficiency of these new carbon materials is based on the established work by us, of the fact that the carbon coatings with monocrystalline or polycrystalline highly ordered structures and linear chains of carbon increase essentially the level of molecular ordering in lubricating boundary layers and ensure adsorption of boundary layers on the coatings. Boundary layers repeat highly ordering structures presented by surface of the coating what results in improving lubricating ability, boundary layers thermal stabilization, extending the ranges of operating temperatures of oils, etc. Besides that, using the mentioned coatings allows lowering the number of additives in lube oils. A new type of functional materials of diamond like carbon (DLC) namely nanostructured coating-orientants and PVD process is developed to produce thick (DLC + AlTiN) coating on any metal or ceramic substrates. The new type of the functional materials has no analogues in triboengineering. The findings suggest that the nanocomposite coatings with orientating effect on boundary layers are advantageous for improving antifriction characteristics and for governing processes of boundary lubrication.

Biography

Vladimir Levchenko completed his Doctorate in Physics at the Lomonosov Moscow State University in 1988 and Doctoral studies at Lomonosov Moscow State University in 1999. He is the Director of Nanotribology centre LMSU – BIES RAS (Lomonosov Moscow State University – Blagonravov Institute of Engineering Science, Russian Academy of Sciences). CEO Skolkovo. He is Member of 8 international scientific societies. He has published 3 monographs and more than 220 papers in reputed journals and serving as an Editorial Board Member of repute. He is awarded by the international 4 Grand Prix and more than 40 gold medals for achievements in a science.

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MONOMERS, BIOPOLYMERS AND BIOMATERIALS FROM RENEWABLE LIPID RESOURCES

Aman Ullah
University of Alberta, Canada

In recent years, the use of renewable natural resources have become the focus of research in supplementing and/or replacing traditional petrochemical products due to growing energy demands and environmental concerns. The utilization of lipids and other renewable resources has been considered to play a primitive role towards sustainable development due to their large scale availability, built-in-functionality, biodegradability and no net carbon dioxide (CO_2) production. In addition, a broad range of monomers can be obtained as a single feedstock. These attributes make lipids a good fit for the development of renewable biomaterials. This presentation will focus on the conversion of lipids, from various sources including waste streams such as waste cooking oil and lipids extracted from spent foul, into monomers, biopolymers and biomaterials for packaging water remediation, biomedical and other applications. The ability for complete conversion of oils in just few minutes under solvent free conditions into monomers, biopolymers and bio-composites/nanocomposites is undoubtedly an attractive concept from both an academic and an industrial point of view.

Biography

Aman Ullah has received his PhD (with distinction) in Chemical Sciences and Technologies in 2010 at the University of Genova, Italy by also working together at Southern Methodist University, USA. He worked as a Postdoctoral fellow before accepting an Assistant Professor position at the University of Alberta. He has been promoted to Associate Professor with Tenure. He has been teaching a graduate course entitled Renewable Biomaterials. This course deals with fundamentals in bio-based materials development, characterization, and various industrial applications. He has published more than 40 papers in reputed journals and 5 patents/patent applications. His research is focused on the development of biochemicals, biopolymers/biomaterials from lipids and other renewable resources. He has participated and presented his work in more than 90 national and international scientific meetings and conferences, including several invited, keynote and plenary lectures at conferences and research centres in Asia, Europe, and America. In addition, he has received several awards including Canadian Rising Star award by Grand Challenges Canada.

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