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INNOVATIONS IN NATURAL SCIENCES - THE FACTOR OF DEVELOPING SCIENCE

In the 20th century, hopes began to be placed on Nanotechnology. At the heart of hope lay a seeming opportunity to solve problems with the production of new materials, using controlled construction of the microstructure and forecasting the course of technological processes. The scientific community has become convinced that "nanotechnologies", as they were advertised, cannot ensure the mass production of the necessary products and materials, and the basis of obtaining innovative materials are the usual physicochemical or chemical processes associated with phase transitions. In 2016, a law on chemistry was lobbied in the US Congress (Chemical and Engineering News, 2016, American Chemical Society) and a group was created whose task is to explain to senators the importance of chemistry for industrial production and the economy as a whole. Great efforts are being made to solve pressing problems in current areas of chemical technology. The increase in the number of experimental data, which are considered anomalous, causes an increasing attention to the experimental solution of actual problems. This leads to an unjustified increase in labor costs. This circumstance should dictate the need for the development of deep fundamental research in all aspects of natural science. The reason for the lack of effort in basic research lies in the presence of a crisis in the natural sciences. The Kazakh-British Technical University conducted research in a fundamental direction, which was designated by M Faraday. It is shown that the microstructure of inorganic aqueous solutions and oxide melts has a molecular structure, and these fluids have electronic conductivity type. The phenomenon of coacervation of oxide melts under the influence of alternating electromagnetic fields and mechanical vibrations; anisotropy of the conductivity of melts, etc., revealed an anomalously high electrophoretic mobility of solid particles in melts, etc. The possibility of using the discrete nature of the flow of elementary particles - electrons for the organization of unusual chemical reactions is shown. A hypothesis about heat transfer between material objects with the help of elementary particles - "heating rods" was put forward and substantiated. The calculated mass of the "heat" - 5.15-10-36 kg. The calculated speed of the "heat source" in vacuum is close to the speed of light and, depending on the temperature, is 3.0. 107 - 3.0. 108 m /s.

Biography

Suleimenov E N Graduated from the Kazakh Mining and Metallurgy Institute, Metallurgy Faculty in 1960 with a Specialty of Metallurgical Engineer in the area of non-ferrous, rare and precious metals. He was a Candidate of Technical Sciences (1970), Senior Research Associate (1981), Doctor of Technical Sciences (2005), Fellow of the International Informatization Academy (November, 2004) and a Member of the European Academy of Natural Sciences (January, 2007). After Graduation, he was assigned to work in the Institute of Metallurgy and Ore Beneficiation of the Academy of Sciences of Kazakh SSR. During the work in IMOB performed job duties of a Senior Laboratory Technician (1960-1961), Engineer (1961-1963), Junior (1963-1971) and Senior (1972-1986, 1995-2000) Research Associates, Research Team (multidisciplinary) Leader (1985-1995), Head of laboratory (2004-2005), head of department (2005-2006), Deputy Director for science (2000-2004), Acting Director of the Institute of Metallurgy and Ore Benefication (2004). He also has teaching experience. In 1969-1971, he worked as a Senior Teacher at the department of metallurgical processes and furnaces theory of the Kazakh Polytechnical Institute named after V.I. Lenin. In 1995-1996, (combined duties) he worked as an Assistant Professor at the Department of non-organic substances technology of the Kazakh National Technical University named after K I Satpaev. During the teaching activity he held courses in general metallurgy for metallurgy students, non-ferrous metallurgy plants mechanical equipment students, chemical and environmental engineers. He has developed and held courses in energy technology processes, plasma chemistry etc. He held a practical course in the metallurgical processes theory. Held short courses of lectures on melted slags theory and new processes in heavy non-ferrous metals metallurgy. He is serving as the Deputy Head of the Advanced Materials and Technologies Laboratory of the Kazakh-British Technical University since 2009.

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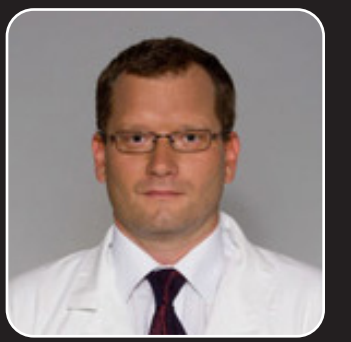

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WNT1-INDUCIBLE SIGNALING PATHWAY PROTEIN-1 IN WOMEN WITH TYPE 2 DIABETES, ITS RELATIONSHIP TO PARAMETERS OF CHRONIC INFLAMMATION AND ENDOTHELIAL DYSFUNCTION

Introduction: WISP-1 (Wnt1 inducible signaling pathway protein--1) is a relatively new adipokine, associated with insulin resistance. The aim of the study was to compare the levels of WISP-1 in women with type 2 diabetes and healthy controls and determine its association with metabolic parameters and with markers of endothelial dysfunction.

Methods: 50 women with type 2 diabetes and 35 healthy women were included in the study. In addition to the WISP-1, levels of adiponectin, adipocyte-fatty acid binding protein (A-FABP), anthropometric and lipid parameters, markers of inflammation, insulin resistance and glucose control were assessed in all participants. Von Willebrand factor (vWF) and tissue plasminogen activator (t-PA) served as the indicators of endothelial damage.

Results: Compared to healthy controls women with type 2 diabetes had higher levels of WISP-1 [54(33-84) pg/ml versus 35(29-61) pg/ml; $p<0.05$], which significantly correlated positively with hs-C-reactive protein (hs-CRP) ($\rho=0.22$), C-peptide ($\rho=0.23$), t-PA ($\rho=0.24$), A-FABP ($\rho=0.30$) and negatively with adiponectin ($\rho=-0.27$). In multivariate regression analysis hs-CRP was only independent predictor for WISP-1 levels.

Conclusion: Women with type 2 diabetes had significantly higher levels of WISP-1 that were associated with inflammation, insulin resistance and other adipokines. WISP-1 correlation with t-PA showed that, this adipokine could play a role in the vascular damage, maybe through its proinflammatory effect.

Biography

David Karasek has completed his MD and PhD from Medical Faculty of Palacky University Olomouc (Czech Republic). He is the Deputy Head of the 3rd Department of Internal Medicine–nephrology, rheumatology and endocrinology and the Head of Center for Diabetes of University Hospital Olomouc. He has published more than 120 papers in reputed journals (as the first author of 44 papers) and has been serving as an Editorial Board Member of four scientific journals *(Interní medicina pro praxi, Farmakoterapeutická revue, Hypertenze a kardiovaskulární prevence, Journal of Disease Markers)*.

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PHOSPHINIDENE COMPLEX PROVIDE DIRECT ACCESS TO NOVEL ORGANOPHOSPHORUS COMPOUNDS

Phosphinidenes are P-analogue of carbenes where P is monovalent with incomplete octet of electrons around it. Free phosphinidenes do not show any reactivity and are highly unstable. They show enhanced stability and reactivity when complexed with organometallic moieties like M $(CO)_5$ (M= Cr, Mo, W). The 2H azaphosphirene complex (1) is one of the precursors known to generate the elcetrophilic phosphinidene complex (2) *in situ* and it is very effective in this approach. Recently, we found that terminal phosphinidene tungsten pentacarbonyl complexes (2) reacted efficiently with the reagents containing no π-systems. For example, a reaction of terminal phosphinidene complex (2) with CCl_4 resulted in halogen atom transfer from carbon to phosphorus. Following these results, we run a few reactions of (2) with substrates containing a single carbon-halogen bond like RX ($C_6H_5CH_2$ or Me; X= Cl, Br or I) and in all cases, only a single prochiral product was formed selectively as a result of the insertion-reaction of phosphinidene complexes (2) into a carbon-halogen bond. This method has provided a novel route for one step selective synthesis of prochiral organophosphorus compounds.

Biography

Arif Ali Khan has received his PhD degree in Chemistry from A M U, Aligarh, India in 1994. Since then he has gained experience as a Research Associate and Senior Research Associate at IIT-Delhi, and as a Post Doctoral Fellow at Technical University of Braunschweig, Germany. He joined as Lecturer in Chemistry at GGSIP University, New Delhi in 2005. His research interests are in the area of coordination chemistry, organophosphorus chemistry, organometallic chemistry, metal ion catalysed/promoted organic synthesis, and Synthesis of biofuels/biodiesel. He has published several research papers in reputed journals. He has successfully completed a number of national projects and international research projects.

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