International Conference on Sustainable Development in Economic Trade, Management & Social Sciences

Bangkok, Thailand
February 11-12, 2019
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disclaimer</td>
<td>4</td>
</tr>
<tr>
<td>Preface</td>
<td>5</td>
</tr>
<tr>
<td>HOST COMMITTEE</td>
<td>6</td>
</tr>
<tr>
<td>Chair’s Welcome</td>
<td>7</td>
</tr>
<tr>
<td><strong>Program at a Glance</strong></td>
<td>8</td>
</tr>
<tr>
<td>List of Conference Attendees</td>
<td>11</td>
</tr>
<tr>
<td><strong>THEME: Business Management &amp; Social Sciences Studies</strong></td>
<td>13</td>
</tr>
<tr>
<td>Value System-based Food Consumption Behaviour Patterns among the Z Generation, in Light of Healthy Consumption</td>
<td>14</td>
</tr>
<tr>
<td>Emerging Powers in a Multipolar System: Realist Constructivism and China's Engagement in the 21st Century</td>
<td>15</td>
</tr>
<tr>
<td>Research Knowledge Utilization on Integrated Municipal Solid-Waste Management and Community Participation for Public Policy in the Deep South of Thailand</td>
<td>16</td>
</tr>
<tr>
<td>Potential of Dairy Sector in India in Boosting Farmers Welfare</td>
<td>17</td>
</tr>
<tr>
<td>Dairy Cooperative A Power of Indian Rural Women Up-liftment</td>
<td>18</td>
</tr>
<tr>
<td>Customer Focus Business Creates Opportunity</td>
<td>19</td>
</tr>
<tr>
<td><strong>THEME: Engineering Technology and Applied Sciences</strong></td>
<td>20</td>
</tr>
<tr>
<td>EMI Shielding Effectiveness and Flexural Properties of Pc Composites Containing Expanded Graphite/CNT Hybride</td>
<td>21</td>
</tr>
<tr>
<td>Effect of Carbon Nanotube on Shear Thickening of Silica Nanoparticle Suspension</td>
<td>22</td>
</tr>
<tr>
<td>CO2 Sorption on Fly Ash Zeolites</td>
<td>23</td>
</tr>
<tr>
<td>Reactions of Conjugate Addition of Nucleophilic Reagents with Coumarins a New Classes Compounds with Potential Antioxidant Activity</td>
<td>24</td>
</tr>
<tr>
<td>Understanding the Local Structure and Properties of Surface Species on Cerium Dioxide Nanoparticle by Computational Modeling</td>
<td>25</td>
</tr>
<tr>
<td>Battery Prototype with a Cell based on Carbon Nanostructures</td>
<td>26</td>
</tr>
<tr>
<td>New Hybrid Materials Based on Carbon Nanotubes and Metal Alloys</td>
<td>27</td>
</tr>
</tbody>
</table>
Disclaimer

These abstracts are provided to all the honourable participants who have submitted their papers and are registered in our conference. Committee has made all the possible efforts to ensure precise/accurate replication of abstracts however if any inaccuracies found in the studies, event organisers will not be liable. Thank You.

Copyright © 2018 Vertex Research Society.

All rights are reserved. Permission is granted for personal and educational use only. Commercial copying, hiring and lending is prohibited. The whole or part of this publication material cannot be reproduced, reprinted, translated, stored or transmitted, in any form or means, without the written permission of the publisher. The publisher and authors have taken care that the information and recommendations contained herein are accurate and compatible with the generally accepted standards at the time of publication. The individual essays remain the intellectual properties of the contributors.

Head Office Address:

Address: Flat_405. Al Razouki Exch. Building Mowaihat_2. Ajman, UAE
Email: info@vrseducation.com
Preface

Vertex Research Society is a forum for dedicated to development of society through research. A major goal and feature of the conference is to bring scholars, professionals, and government agencies together to exchange and share their experiences and research results about the challenges and proposal on the development of society. More importantly this conference will serve as a platform to disseminate research findings and a catalyst to promote innovation. VRS would be proved as a key factor in the transformation of the e-learning field. Through our well established conferences, opportunities of quality learning, and strategies for individual and institutional success we have proven to be a part of this rapid growth.
HOST COMMITTEE

Dr. Balachandar S. Sayapathi (PHD)
Conference Chair
Email: balachandar@vrseducation.com

Mr. Muhammad Zahid Younis
Conference Executive
Email: zahid.khan@vrseducation.com
Chair's Welcome

We are delighted to welcome you to the International Conference on Sustainable Development in Economic Trade, Management & Social Sciences, taking place in "Bangkok, Thailand", from "February 11-12". Education, in our contemporary world, is a right since we are born. Every experience has a formative effect on the constitution of the human being, in the way one thinks, feels and acts. One of the most important contributions resides in what and how we learn through the improvement of educational processes, both in formal and informal settings. Our International Conference seeks to provide some answers and explore the processes, actions, challenges and outcomes of learning, teaching and human development. Our goal is to offer a worldwide connection between teachers, students, researchers and lecturers, from a wide range of academic fields, interested in exploring and giving their contribution in the field of research. We take pride in having been able to connect and bring together academics, scholars, practitioners and others interested in a field that is fertile in new perspectives, ideas and knowledge. We counted on an extensive variety of contributors and presenters, which can supplement our view of the human essence and behavior, showing the impact of their different personal, academic and cultural experiences. This is, certainly, one of the reasons we have many nationalities and cultures represented, inspiring multi-disciplinary collaborative links, fomenting intellectual encounter and development.

We would like to express thanks to all the authors and participants, the members of the academic scientific committee, our media partners and, of course, to our organizing and administration team for making and putting this conference together. Hoping to continue the collaboration in the future.

Dr. Balachandar S. Sayapathi (PhD)
Conference Chair Person
# Program at a Glance

## DAY 1st Monday (February 11, 2019)

**Welcome Reception & Registration**

09:00 - 09:10 am

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:10 am - 09:20 am</td>
<td>Opening Ceremony</td>
</tr>
<tr>
<td>09:20 am - 09:40 am</td>
<td>Introduction of Participants</td>
</tr>
<tr>
<td></td>
<td>Dr. Balachandar S. Sayapathi</td>
</tr>
<tr>
<td></td>
<td>Welcome Remarks</td>
</tr>
<tr>
<td>09:40 am - 09:50 am</td>
<td>Group Photo Session</td>
</tr>
</tbody>
</table>

Grand Networking & Tea Break (09:50 - 10:00 am)
**DAY 01 Monday (February 11, 2019) - Track: Business, Economics, Social Sciences Study**

**Session 01 (10:00 am - 12:30 pm)**

**Venue: Novotel Hotel**

<table>
<thead>
<tr>
<th>EMSS-2019-104</th>
<th>Value System-Based Food Consumption Behaviour Patterns among the Z Generation, in Light of Healthy Consumption</th>
<th>Mónika Fodor-Garai Dr. Habil</th>
</tr>
</thead>
</table>

**Track: Engineering Technology & Applied Sciences**

<table>
<thead>
<tr>
<th>NMEA-FEB-101</th>
<th>EMI Shielding Effectiveness and Flexural Properties of Pc Composites Containing Expanded Graphite/CNT Hybride</th>
<th>Kwan Han Yoon</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMEA-FEB-102</td>
<td>Effect of Carbon Nanotube on Shear Thickening of Silica Nanoparticle Suspension</td>
<td>Young Sil Lee</td>
</tr>
<tr>
<td>NMEA-FEB-106</td>
<td>CO2 sorption on Fly Ash Zeolites</td>
<td>Yuri Kalvachev</td>
</tr>
<tr>
<td>NMEA-FEB-107</td>
<td>Reactions of Conjugate Addition of Nucleophilic Reagents with Coumarins a New Classes Compounds with Potential Antioxidant Activity</td>
<td>Rositca Nikolova</td>
</tr>
<tr>
<td>NMEA-FEB-108</td>
<td>Understanding the Local Structure and Properties of Surface Species on Cerium Dioxide Nanoparticle by Computational Modeling</td>
<td>Georgi N. Vayssilov</td>
</tr>
<tr>
<td>NMEA-FEB-109</td>
<td>Battery Prototype with a Cell based on Carbon Nanostuctures</td>
<td>Wojciech Ciesielski</td>
</tr>
<tr>
<td>NMEA-FEB-110</td>
<td>New Hybrid Materials based on Carbon Nanotubes and Metal Alloys</td>
<td>Damian Kulawik</td>
</tr>
</tbody>
</table>

**Lunch Break (12:30 pm - 01:30 pm)**
### Session 2 (01:30pm 02:30pm) Track 02: Business Management & Social Sciences

<table>
<thead>
<tr>
<th>EMSS-2019-110</th>
<th>Research Knowledge Utilization on Integrated Municipal Solid-Waste Management and Community Participation for Public Policy in the Deep South of Thailand</th>
<th>Dr. Sawpheeeyah Nima</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMSS-2019-111</td>
<td>Potential of Dairy Sector in India in Boosting Farmers Welfare</td>
<td>Tanmay Hazra</td>
</tr>
</tbody>
</table>

**Closing Ceremony**
List of Conference Attendees

The following scholars/practitioners/educationists who don't have any paper presentation, however they will attend the conference as delegates & observers.

<table>
<thead>
<tr>
<th>No</th>
<th>Official ID</th>
<th>Name</th>
<th>Affiliation Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NMEA-FEB-103A</td>
<td>Arie Herskovits</td>
<td>Tel Aviv University, Israel</td>
</tr>
<tr>
<td>2</td>
<td>NMEA-FEB-104A</td>
<td>Jacob Lifshitz</td>
<td>Tel Aviv University, Isreal</td>
</tr>
<tr>
<td>3</td>
<td>BKM-339-101A</td>
<td>Dr Nazzareno Di Tullio</td>
<td>Ufficio Comunicazione ed Eventi, Italy</td>
</tr>
</tbody>
</table>
DAY 02 Tuesday (February 12, 2019)

Whether visiting from overseas or interstate, delegates and guests are free to discover Bangkok, Thailand and its surrounds by their own (Optional).
Value System-based Food Consumption Behaviour Patterns among the Z Generation, in Light of Healthy Consumption

Mónika Fodor-Garai Dr. Habil

The opportune nature of the topic is based on two pillars: value system-based consumer behaviour sciences, and generation marketing. In my study, I chose value system-based theories among the various behavioural sciences as the focus, which have the common characteristic of suggesting a connection between the reasons for consumers choosing various products or services, and the consumers’ value systems. This base concept inspired me to conduct my own primary data analysis, and try to find connections between value systems and consumer behaviour on my own. Specifically, I wished to analyse the foodstuffs consumption habits of the Z Generation, or to be more precise, healthy eating habits. The other pillar of the topic is generation marketing, which also states that value systems are the differentiator among the different generations. In light of the Z generation being the potential customer base creating a demand that is willing and capable of paying, I believe it is fruitful and imperative that the specific foodstuffs consumption preferences and decisions be understood about this generation. During my primary research, I focused on the Z Generation’s members, collecting qualitative and quantitative data, and conducting analyses on this generation’s value system, foodstuffs consumption behaviour, and their ideas about healthy eating habits. As part of the qualitative research, I conducted twenty mini focus group interviews using semi-structured method. In addition, as the quantitative research, I conducted a fully standardised questionnaire, where I received more than 500 sufficient answers. I applied a filter during both research analyses, according to which the participants have to be members of the Z generation due to their age. Based on the results, we can see the value orientation of the future generation, and understand how important they consider their own health, and what they do to preserve it. Beyond this, research results also help outline the relevant food consumption habits of the generation, which may help define the target groups of healthy lifestyle, and better organise health education campaigns aimed at the Z Generation.

Keywords: value system-based consumer behaviour, Z generation, healthy eating habits.

*Vice-Dean for Education, associate professor, Óbuda University Keleti Karoly Faculty of Business and Management, Hungary
Email: fodor.monika@kgk.uni-obuda.hu
Emerging Powers in a Multipolar System: Realist Constructivism and Chinas Engagement in the 21st Century

Isaac Nunoo

The commencement of the 21st has witnessed the assertiveness of certain developing states in their zest for not only regional supremacy but also global recognition. States like Brazil, India, China and South Africa have become more assertive and influential in their respective regions, gradually becoming regional powers or being regarded as such. In the case of China and India, their influence is even more profound in the global arena, whereas South Africa and Brazil impact their regions and make conscious efforts at the international level too. These new emerging powers are believed to be unique in their relations with other states as well as in the strategies they employ in their quests for ascendency in the management of global affairs. They are often perceived as not having clear-cut foreign policies or simply, suffering from strategic ambiguity and graduation dilemma. They are presumed to shape the order of their distinct geographical areas, perform a more proactive role in international politics and thus contribute to the stability of the global order. The United States regards Brazil as a natural partner and shares common values in Indias democratic achievements while expecting China to become a responsible stakeholder sharing power to maintain order. The 21st century emerging powers have usually been analyzed based on economic context. Marginal attention has been paid to the broader spectrum of strategic foreign policy approaches adopted by these powers, and how, subtly, they conduct themselves outside the orbit of economics. Beijings ability and willingness to engage with states with different political ideologies as well as perceived unfriendly nations present a unique threshold for assessing the foreign policy trajectories of powerful states in the multipolar world. Focusing on constructivist norms, values and ideas coupled with realist national interest, Beijing is able to pursue its national goals and global ambition in a manner best considered as a "niche diplomacy" rather than aggression. It has created and supported not only regional bodies but also global institutions such as the Shanghai Corporation Organization, ASEAN, UN, WTO etc. Using China as case, this article discusses succinctly, the FP trajectories of the new emerging powers. It concludes that these powers often employ a strategic use of the underscoring principles of realism and constructivism in their engagement within their regions and beyond.

Keywords: emerging powers, China, realism, constructivism, regional and global institutions.

Jilin University, China
Email: inubs@yahoo.com
Research Knowledge Utilization on Integrated Municipal Solid-Waste Management and Community Participation for Public Policy in the Deep South of Thailand

Dr. Sawpheeyah Nima1, Pitchaya Nualdaisri2, Ilfarn Tolaema3, Pongthep Suteeravut4

Background: Knowledge translation for research utilization is important process for community to learn and properly use of research findings such as decision making based on evidence. However, a large gap exists between research production and practice. Few studies have conducted the research utilization in public policy for community waste management solutions. Purpose: The objectives of the study were to describe the knowledge from research, gap between knowledge and practice, translation to communities, and policy recommendations for strategies to improve the use of evidence in community waste management problems. Methodology: This study is an action research based on Innovation diffusion theory initiating to solve community waste problem in real situation by community participation targeting residents living in 3 provinces in the Deep South of Thailand. The pre-selection of 4 communities was carried out in November 2017- December 2018, based on waste problem concerns. Data were collected by public meeting and community forum and field observation and then were analyzed by content analysis. Findings: The study was conducted in five stages were: (1) knowledge findings from research were discussed within communities providing a unique synthesis of evidence, (2) persuasion to communities to implementation including public policy, (3) community decision for proper solutions, (4) implementation in each community, and (5) confirmation and evaluation. Suggestion and conclusion: The research utilization for public policy in community waste management, could be practiced in a long period. This can be suggested that developing an integrated strategy should also draw paradigms from the socio-economic context of this area.

Keywords: Knowledge Utilization; Municipal Solid-Waste Management; Community Participation; and Public Policy

1,4Heath System Management Institute. Prince of Songkla University, Hat Yai, Songkhla, Thailand,
2Faculty of Pharmaceutical Sciences, Prince of Songkla University, Hat Yai, Songkhla, Thailand, 3Thai Islamic Medical Association (TIMA), Yala, Thailand
Email: sophienima@gmail.com, sawpheeyah.n@psu.ac.th
Potential of Dairy Sector in India in Boosting Farmers Welfare

Tanmay Hazra¹, Parmar M P², Ramani V M³

Animal husbandry and dairying sector is one of the important sectors in India, which supply us with respective amount of income as well as employment for the rural population. It contributes about 25 percent of the value of output from total agricultural and allied sectors. India achieved the status of largest milk producer since 1990s and still this trend is going on. Traditionally livestock provide the much needed supplementary income to farmers all over India. Next to crop production, animal husbandry is the most important income generating activity in farm households, supplementary households. Over 70 percent of rural household keep livestock of one species or other and earn income out of them. The dairy production (sale of milk) alone account for the bulk of the contribution to the household income from livestock. Dairying is fast becoming an industry with its roots extended to the poorest man in the villages. In 2020 dairy industry would be the highest man power requirement industry. But to make the situation more attractive through development of these people there is a need of entrepreneurship development.

Keywords: woman, dairy co-operative.

¹Assistant Professor, Dairy Chemistry Department, College of Dairy Science, Kamdhenu University, Amreli, Gujarat, India, ²Assistant Professor & Head, Dairy Business Management Department, College of Dairy Science, Kamdhenu University, Amreli, Gujarat, India, ³Principal & Dean, College of Dairy Science, Kamdhenu University, Amreli, Gujarat, India

Email: tanmayhazra08@gmail.com
Dairy Cooperative  A Power of Indian Rural Women Up-liftment

Parmar M P\textsuperscript{1}, Tanmay Hazra\textsuperscript{2}, Ramani V M\textsuperscript{3}

Rural women suffer the curse of being both socially and economically invisible. The civil society organizations work towards making them visible in these areas. However, an organization with an open membership and democratic control will be more effective than other types of civil society organizations working for promoting social change and economic development. A dairy cooperative is one such civil society organization which aims at furthering the lot of the rural people. Dairying has been an agriculture allied sector and indoor based economic activity for women living in rural areas. It provides mass employment and economic development to the rural masses. It is a vibrant rural economic institution to enhance rural industrialization and promote the social and economic progress of rural people. Rural landless, small and marginal agricultural farmers and women are involved in the process of production of milk and its bye-products. Dairy cooperatives, as grass root level socio-economic organizations, have been working for the up-liftment of the rural masses and thereby the socioeconomic development of rural areas.

**Keywords:** Woman, dairy co-operative.

\textsuperscript{1}Assistant Professor & Head, Dairy Business Management Department, College of Dairy Science, Kamdhenu University, Amreli, Gujarat, India, \textsuperscript{2}Assistant Professor, Dairy Chemistry Department, College of Dairy Science, Kamdhenu University, Amreli, Gujarat, India, \textsuperscript{3}Principal & Dean, College of Dairy Science, Kamdhenu University, Amreli, Gujarat, India

Email: parmarmanish47@gmail.com
Customer Focus Business Creates Opportunity

Ramani V M\textsuperscript{1}, Parmar M P\textsuperscript{2}, Tanmay Hazra\textsuperscript{3}

Operations and supply chain management transform resource or data inputs into desired goods, services, or results, including what they are, how they support the organizations overall strategy, and how they help a firm provide value to the customer. The number of global competitors and foreign players in the market are large and whether the manufacturing organization is an Indian organization or a foreign company, they have to face this global competition. It is also necessary for manufacturing organizations to be proactive and make proactive decisions so that, they do not have the disadvantage of having to react to changes, that competitors and others make. In addition, there has to be increased customer focus, because the business comes from the customers and customers are far more demanding and to some extent, far less loyal today. If the manufacturing and service is not up to the expectation of the customer, todays customer has enough alternatives to consider and the manufacturing organization would lose it is business. Now, once the availability and price requirements are met, the quality requirement started coming and the customer was keen that, the quality provided by the manufacturer was good enough. This also meant that, manufacturing had to ensure that, the quality of the products was good, there was less of rejects, and there was emphasis more on after sale service and warranties, which are related to the quality of the product.

Keywords: Business, customer.

\textsuperscript{1}Principal & Dean, College of Dairy Science, Kamdhenu University, Amreli, Gujarat, India, \textsuperscript{2}Assistant Professor & Head, Dairy Business Management Department, College of Dairy Science, Kamdhenu University, Amreli, Gujarat, India, \textsuperscript{3}Assistant Professor, Dairy Chemistry Department, College of Dairy Science, Kamdhenu University, Amreli, Gujarat, India

Email: vimalmramani@gmail.com
EMI Shielding Effectiveness and Flexural Properties of Pc Composites Containing Expanded Graphite/CNT Hybride

Kwan Han Yoon*

The microstructure, flexural properties, and electromagnetic interference (EMI) shielding effectiveness (SE) of PC composites filled with multi-walled carbon nanotube (CNT), heat treated expanded graphite (eG) and eG-CNT composite powder were investigated. For PCM (e5c5) and PCM (e1c9) composites with more than 5 wt% CNT, the EMI SE increased with the filler content and average 20 dB of EMI SE was obtained more than 10 wt% filler content. The synergistic effect of the composite powder was observed in these composites for the EMI SE. The target EMI SE of 20 dB required the surface resistivity of at least 3 Ω/sq. The wide plate-shaped eG was more effective than CNT for the flexural strength and modulus of the PC composites. The use of the composite powder of eG and CNT showed a synergistic effect on the flexural properties of PC composite.

Keywords: multi-walled carbon nanotube, expanded graphite, polycarbonate, nanocomposite, EMI shielding effectiveness.

Kumoh National Institute of Technology, Korea
Email: snishida@gunma-u.ac.jp
Effect of Carbon Nanotube on Shear Thickening of Silica Nanoparticle Suspension

Young Sil Lee

Shear thickening effect of concentrated particular suspension has recently become one of the most interesting behaviors from a rheological point of view. It shows a dramatic increase in the shear viscosity when shear rate or stress reaches to a certain value. This kind of liquid-to-solid transition enable to make the body armour and energy absorbing devices with light weight and flexibility compared with the conventional devices. In this study, the shear thickening fluid based on the suspension of silica nanoparticles in polyethylene glycol has been prepared. The addition of a small amount of multi-walled carbon nanotube (MWNT) into a silica nanoparticle suspension can enhance the effect of shear thickening with significant change in viscosity, critical shear rate for the shear thickening transition. The suspension of silica nanoparticle with MWNT exhibits a similar viscosity trend as a function of shear rate, but it has led to remarkable changes in the viscosity and critical shear rate with significantly lower concentrations. This result can be used to make stronger and lighter body armour.

Keywords: body armor, carbon nanotube, shear thickening, silica nanoparticle, rheological behavior.

Kumoh National Institute of Technology, Korea
Email: youngsil@kumoh.ac.kr,youngsil2249@gmail.com
CO2 Sorption on Fly Ash Zeolites

Yuri Kalvachev

Coal combusting power plants are simultaneously among the main emitters of carbon dioxide and the main generator of solid by-products, such as fly ash (FA). An attempt to find a common solution for these environmental problems is reported. Zeolites analcime and faujasite (X) have been successfully synthesized by interaction of FA, originating from lignite coal at Maritsa Iztok 2 thermal power plant with sodium hydroxide, followed by hydrothermal treatment. NaX zeolite crystallisation started later by decreasing NaOH amount. In order to optimise synthesis process a seed-assisted procedure was introduced. In this way, zeolitisation may increase cost-effectiveness and eco-efficiency. Synthesized zeolites were used in environmental protection processes - zeolite X in CO2 adsorption and analcime in purification of phenol contaminated water. Determination of adsorption capacity towards CO2 was measured to be 60 mg g⁻¹ and the adsorption-desorption equilibrium was reached after one hour. The adsorption capacity towards phenol was measured to be 14 mg g⁻¹ adsorbent.

Keywords: fly ash, zeolite X, thermogravimetric analysis, carbon capture.

Institute of Catalysis, Bulgarian Academy of Sciences, Acad. G. Bonchev St., Bl. 11, 1113 Sofia, Bulgaria
Email: kalvachev@ic.bas.bg
Reactions of Conjugate Addition of Nucleophilic Reagents with Coumarins: a New Class of Compounds with Potential Antioxidant Activity

Rositca Nikolova*

Coumarins are natural compounds with wide application in organic synthesis as acceptors in different organic reactions with nucleophilic reagents and dienophiles in Diels-Alder reactions as well in reactions of [2+2] or [2+3] cycloaddition and as intermediates in the synthesis of products of practical interest. On the other hand, especially important are their antimicrobial, antiviral, anticancer, enzyme inhibition, anti-HIV, and antioxidant activities as well as their influence over central nervous system. A third large area of application of coumarin derivatives are modern technologies. They can be applied as excellent luminophores and laser dyes. Coumarin derivatives may be used as ligands for metal complexes and for modification of organic and inorganic supports. The investigations on the chemical behavior of the 3-substituted 2-oxo-2H-1-benzopyranes (coumarins) toward nucleophilic reagents represented them as good acceptor in the 1,4-addition reactions. Reactions of the 3-substituted coumarins with organomagnesium, and organozinc reagents as well as with Ivanovs reagent were carried out and the corresponding 2-oxochromanes were isolated with good yields. The reactions with their analogs 1,2-benzoxaphosphorine as substrate had the same synthetic progress but in these cases were isolated only two of possible diastereoisomers. The reactions were carried out under ultrasound irradiation and the yields of the target products were higher and the results were accurate and precise. Interestingly nucleophilic addition of halogen substituted anhydride in the presence of Zn lead to formation of biscoumarins. Conditions suggested by us represent a new method for the synthesis of this type of compounds under simple and eco-friendly experimental set up. Acknowledgment: The authors are grateful to the H2020 Project MaterialsNetworking.

Keywords: nucleophilic, reagents.

Faculty of Chemistry and Pharmacy, University of Sofia 1126 Sofia, BULGARIA
Email: rnikolova@chem.uni-sofia.bg
Understanding the Local Structure and Properties of Surface Species on Cerium Dioxide Nanoparticle by Computational Modeling

Georgi N. Vayssilov*

Cerium dioxide is a reducible oxide, widely used in various catalytic systems for redox processes either as an individual active phase or as support/component of more complex catalytic systems. Its main feature is the oxygen storage capacity, allowing release and accommodation of oxygen depending on the reaction conditions. The reduction of cerium dioxide results in formation of O vacancies, which is accompanied by reduction of two Ce4+ cations to Ce3+. This behavior of cerium dioxide is found to depend strongly on the nanostructuring of the material [1,2]. In order to clarify the specific properties of nanosized particles of cerium dioxide we performed series of quantum chemical calculations of model systems! containing pristine ceria nanoparticles, supported Pt species as active phase, doped structure with other metal ions, as well as intermediate surface species. The calculations were performed with DFT+U approach using periodic code VASP with the gradient corrected PW91 exchange-correlation functional. The valence wave functions were expanded in a plane-wave basis with a cutoff energy of 415 eV. Cerium dioxide nanoparticles containing 21 or 40 cerium ions are used as model systems. Using quantum chemical modelling with periodic boundary conditions we investigated deposited platinum clusters and isolated ions on cerium dioxide support and CO adsorption and oxidation on them [2-6]. The relative stability of several reduced and oxidized structures as well as different locations of the platinum was modelled.

Keywords: Local Structure, Stability.

Faculty of Chemistry and Pharmacy, University of Sofia, 1126 Sofia, Bulgaria
Email: gnv@chem.uni-sofia.bg
Battery Prototype with a Cell based on Carbon Nanostructures

Wojciech Ciesielski*

The main objective of this project is the development of a new generation of electrodes that can be used as a link in a new battery friendly for environment. The specific aims of project are studies on the synthesis, structure determination and the physico-chemical properties and experiments aimed for use as components analogues of lithium-sulfur batteries or lithium ion batteries, respectively, organic disulfide compounds or lithium salts of organic dioxoohetroacids and selenooxoheteroacids. The subject matter of the proposed project develops and is also an attempt to broaden the topics implemented as part of completed recently 3 grants founded by National Science Centre of Poland. The results of portion of the research conducted in the framework of these projects have led to experiments testing the use of derivatives of multi-walled carbon nanotubes (MWCNT) functionalized by substituents generated from organic phosphorus sulfur- and selenoacid as starting materials to construct the electrodes in batteries, generating at the same time suggesting the use of organic disulfide derivatives (in particular disulfides organophosphate) as one of the elements analogs lithium-sulfur. On the other hand a suggestion as to the possibility of using salt of organophosphate thioacids as a component of electrolytes in batteries lithium - ion results from the fact which show the performance characteristics of ionic liquids. Full analysis of physicochemical obtained nanotube systems using thermal analysis DSC / TG, analysis using electron microscopy SEM with EDS analysis and NMR spectroscopy will be carried out. The full analysis will be carried out electrochemical processes (charge-discharge cells, voltamperometry, chronovoltamperometry, impedance measurements) and testing the toxicity of these systems for natural environment (Microtox aparat, vegetation hall). Implementation of the proposed project leads to an increased library of knowledge on new materials contained Li ions. The test materials are new, so they’re not described group of compounds in the chemical literature, in which the presence of Li ions creates a favorable possibility of inducing new features and provide the appearance of useful physicochemical properties of the derivatives obtained upon use as substrates in the chemistry of the new materials[ in particular, electrochemical] and new substances for controlling the electrode processes.

Keywords: Battery, carbon nanostructures, functionalization of carbon.

Jan Długosz University in Częstochowa, Poland
Email: wc@ajd.czest.pl, w.ciesielski@interia.pl
New Hybrid Materials Based on Carbon Nanotubes and Metal Alloys

Damian Kulaiwk*

Storage the hydrogen in the solid materials is safe and effective way to store energy. This type of cell can be used both for stationary and mobile equipment. The main requirements for modern materials for hydrogen storage in the automotive industry are: high gravimetric density, easy absorption / desorption of hydrogen at normal temperatures and pressures, low price of materials and their ecological safety. Conventional hydrides, such as LaNi5H6 and derivatives of zirconium and titanium alloys are commonly used in hydrogen storage systems have the storage capacity of less than 2% by weight of hydrogen. Four major groups of suitable materials include: a) carbon and other materials with high surface areas (nanotubes, graphite nanofibers, zeolites, etc.); b) H2O-reactive chemical hydrides (NaH, LiH); c) hydrides complex (LiAlH4, NaAlH4, etc.), borohydrides amine (NH3BH3); d) alloys and intermetallics. Hydrides of rare earth metal (R) and transition metal alloys (T) are very well researched. These materials show good kinetics, but capacity and desorption temperature are low. On the other hand the hydrides complex of the lithium alloys have enjoyed in recent years, large attention as materials for energy storage in the future. The hydrogen content is achieved in accordance with the literature value of 18% mass for LiBH4. However, these compounds only desorb hydrogen at a temperature about 600°C. Large prospects in the process of sorption / desorption of hydrogen and therefore solving of this problem are lightweight multicomponent lithium alloys and carbon nanotubes. The addition of mono- and multi-walled carbon nanotubes to as described above alloys increase the absorption of hydrogen.

Keywords: Hybrid, Carbon.

Jan Dlugosz University in Czestochowa, 13/15 Armii Krajowej Ave., 42-200 Czestochowa, Poland
Email: d.kulawik@ajd.czest.pl, kulawik.damian@gmail.com
Vision

Facilitating Easier & Wider Knowledge Dissemination