

Fakulti Sains Dan Matematik

Rujukan Tuan :
Rujukan Kami : UPSI/FSMT/IPCSM/2013/KS-1
Tarikh : 23 April 2013

Professor Dr. Kristian H. Sugiyarto
Coordinator of International Class
Dept. of Chemistry Education
Yogyakarta State University

Dear Professor Sugiyarto,

Invitation as Keynote Speaker for International Post-Graduate Conference on Science and Mathematics 2013 (IPCSM 2013)

We pleased to inform you that Faculty of Science and Mathematics Universiti Pendidikan Sultan Idris (UPSI) will be organized International Post-Graduate Conference on Science and Mathematics 2013 (IPCSM2013), schedule from 5-6 October 2013 at Convention Hall, E-Learning Building UPSI Tanjong Malim, Perak Malaysia.

It is an honor and privilege to invite you to participate in this conference as Keynote Speaker entitle **‘Misconception in Chemistry Textbooks and Teachers as Users; Case Study on the concepts of Quantum Numbers and Electronic Configurations for Senior High School in Yogyakarta, Indonesia.’**

We believe that your contribution to the field and knowledge sharing on this topic will be of great benefit. We look forward to a positive confirmation and kindly RSVP by August 2013 to the Conference Secretary Dr Norhayati Hashim, at norhayati.hashim@fsmt.upsi.edu.my

Thank you

Sincerely,



(PROF. DR. MUSTAFFA AHMAD)

Dean

Faculty of Science and Mathematics

Universiti Pendidikan Sultan Idris Tanjung Malim, Perak **MALAYSIA**

s.k : Timbalan Dekan (Akademik dan Pembangunan Pelajar) FSMT
Timbalan Dekan (Pengajian Siswazah dan Penyelidikan) FSMT
Penolong Pendaftar Kanan, FSMT
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Fakulti Sains Dan Matematik

Rujukan Kami : UPSI/FSMT/IPCSM/2013(SJ-5)
Tarikh : 30 September 2013

Prof. Kristian Handoyo Sugiyarto
Pendidikan Kimia
Fakultas Matematika Dan Ilmu Pengetahuan Alam
Universitas Negeri Yogyakarta
Jalan Marsha Adisucipto
55281, INDONESIA

Assalamualaikum dan Salam Sejahtera,

Yang Berbahagia Prof.,

JEMPUTAN SEBAGAI PENYAMPAI UCAPTAMA DI INTERNATIONAL POST-GRADUATE CONFERENCE ON SCIENCE AND MATHEMATICS 2013 (IPCSM 2013)

Dengan hormatnya saya merujuk kepada perkara di atas. Adalah dimaklumkan bahawa Fakulti Sains dan Matematik, UPSI akan mengadakan International Post-Graduate Conference On Science And Mathematics 2013 (IPCSM 2013).

2. Maklumat seminar ini adalah seperti butiran di bawah:

Tarikh : **05 Oktober 2013 (Sabtu)**
Masa pembentangan : **4.15 petang**
Tempat : **Dewan Konvensyen, Bangunan E-Learning, Kampus Sultan Abdul Jalil Syah, UPSI**


3. Sehubungan itu, pihak Fakulti amat berbesar hati untuk menjemput Yang Berbahagia Prof. untuk menyampaikan ucap-tama dalam seminar ini. Bersama ini disertakan kad jemputan bagi seminar yang dimaksudkan.

4. Kehadiran Yang Berbahagia Prof. ke seminar ini pasti menjadikan ianya lebih bermakna bagi peserta IPCSM 2013 dan warga Fakulti Sains dan Matematik, UPSI.

Sekian, terima kasih.

**"PENDIDIKAN GEMILANG MENUJU WAWASAN"
"MEMUPUK MINDA KREATIF"**

Yang benar,


(PROF. DR. MUSTAFFA BIN AHMAD)
Dekan
Fakulti Sains dan Matematik

s.k Timbalan Dekan (Akademik dan Pembangunan Pelajar) FSMT
Timbalan Dekan (Pengajian Siswazah dan Penyelidikan) FSMT
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International Post Graduate Conference on Science and Mathematics 2013

Research in Science and Mathematics
Catalyse Sustainable Future

IPCSM2013

- Date : Saturday, October 5th, 2013
Venue : Convention Hall, E-Learning Building,
Universiti Pendidikan Sultan Idris
Organised by : Faculty of Science and Mathematics,
Universiti Pendidikan Sultan Idris



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Universiti Pendidikan Sultan Idris



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SURAT IZIN / PENUGASAN

Nomor: 891/UN34.36/LN/2013

Merujuk pada surat dari Prodi Klas Internasional (KI) Pendidikan Kimia, tertanggal 30 Mei 2013, tentang pelaksanaan kegiatan *sit-in* mahasiswa Prodi Klas Internasional Pendidikan Kimia ke UPSI Malaysia, dengan ini Rektor Universitas Negeri Yogyakarta mengizinkan/menugaskan dosen berikut:

No.	Nama	Pangkat/Gol	Unit Kerja
1.	Prof. KH. Sugiyarto, M.Sc., Ph.D NIP 19480915 196806 1 001	Guru Besar/Pembina Utama Muda (IV-c)	Dosen Pendidikan Kimia/FMIPA UNY
2.	Heru Pratomo, A.L, M.Si NIP 19600604 198403 1 002	Lektor Kepala/Pembina Utama Muda (IV-c)	Dosen Pendidikan Kimia/FMIPA UNY

Keperluan : Mendampingi mahasiswa Prodi Klas Internasional Pendidikan Kimia mengikuti program *sit-in* ke UPSI Malaysia
Tempat : UPSI Malaysia
Waktu : 28 September-8 Oktober 2013
Keterangan : Biaya ditanggung DIPA UNY 2013 melalui RKPT FMIPA

Surat ini diberikan kepada yang bersangkutan untuk dilaksanakan dengan sebaik-baiknya dan setelah selesai agar dilaporkan hasilnya.

17 Juli 2013

Rektor,

Prof. Dr. Rochmat Wahab, M.Pd., M.A.
NIP19570110 198403 1 002

Tembusan:

1. Wakil Rektor I, II, III, IV;
2. Dekan FMIPA;
3. Kepala Kantor Urusan Internasional dan Kemitraan.

PROFESOR DR. MULYATI AHAMAD
Fakultas Keguruan dan Ilmu Pendidikan
Universitas Padjadjaran



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International Post Graduate Conference on Science and Mathematics 2013

Research in Science and Mathematics Catalyse Sustainable Future

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Universiti Pendidikan Sultan Idris

www.upsi.edu.my

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INTERNATIONAL POST GRADUATE CONFERENCE
ON SCIENCE AND MATHEMATICS 2013
(IPCSM 2013)

PROGRAMME BOOK
&
COMPILATION OF ABSTRACTS

5 - 6 OCTOBER 2013
UNIVERSITI PENDIDIKAN SULTAN IDRIS, MALAYSIA

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FOREWORD Vice Chancellor, Universiti Pendidikan Sultan Idris (UPSI) & Patron of the Conference

*Assalamualaikum wa Rahmatullahi wa Barakatuh &
Salam Sejahtera
Aldan wa Sahlan wa Marhabah Bikam*



Alhamdulillah, we have been granted the opportunity to host IPCSM 2013. First and foremost, I would like to welcome all to the IPCSM 2013 especially to all the scholars and academicians for making this conference a historical event. I believe this conference plays a significant role to share knowledge and wide research area of the latest technology.

In the year of 2013, UPSI as a leader in education will take a further quantum leap in driving our potential and capabilities towards new generation of development. Furthermore, I hope IPCSM 2013 may accelerate UPSI towards excellence in empowerment of human capital, transformation of knowledge and enhance research and innovations.

Therefore, it is my greatest pleasure to honour the IPCSM 2013 that facilitates the sharing of research findings, idea and networking opportunities in the various aspects and areas.

Finally, I would like to express my appreciation to the organizing committee's effort in bringing together all researchers and practitioners to participate in IPCSM 2013 conference. May this conference be the door to inspiration and potential to explore new platforms of knowledge.

Thank you.

Prof. Dato' Dr. Zakaria b. Kasa

MESSAGE
Deputy Vice Chancellor (Research & Innovation), UPSI
& Advisor of the Conference

Assalamu alaikum wa Rahmatullahi wa Barakatuh

It is my great pleasure to extend a sincere welcome to all of you who are participating in IPCSM 2013 conference, the first International Post Graduate Conference on Science and Mathematics 2013, being held here at our beautiful and historical campus, UPSI, Tanjung Malim, Perak, Malaysia. "Selamat Datang" (Welcome!)

UPSI is known as a leading university in education, nevertheless we are also committed to provide opportunities for researchers to express their interests and expand their knowledge in various areas of research. The advancement of research in science and mathematics is important for future development in the context of globalization, high quality human capital and education is a critical aspect to be prioritised. The research findings are important to support capacity for knowledge, creativity, innovation and nurturing a learned society.

The conference presents a great opportunity for participants to interact and gain an overview of research not only from local institutions or universities but also internationally. Designed for the research-minded people, this conference will offer a platform for the post graduates students to learn and exchange ideas in relation to many aspects of their studies and establish a good networking collaboration.

I certainly believe that the conference will bear fruitful results and sets a potential deliberation. I wish you all success and also enjoy the fascinating Malaysia that rich in biodiversity, friendly multi-cultural people and cuisine.

I am delighted to thank the enthusiastic team of committee members, who have devoted their efforts, time and expertise to ensure the conference successful. Without your continuous and genuine efforts, the success of this conference would not be possible.

Prof. Dato' Dr. Noraini bt. Idris



MESSAGE
Dean, Faculty of Science and Mathematics, UPSI

Assalamu alaikum wa Rahmatullahi wa Barakatuh and Sincere Greeting to all

On behalf of the Faculty of Science and Mathematics, Universiti Pendidikan Sultan Idris (UPSI), I would like to extend the warmest welcome to all honored participants and distinguished delegates to IPCSM 2013.

The Faculty of Science and Mathematics is proud of its Centre of Excellence for Learner Diversity and its goal for enhancing research and consultation on diverse learners and their needs. This conference will serve as an ideal platform for academicians, researchers and students to share their ideas and experiences in science, mathematics and education research. I am glad that experts in various fields of science, mathematics and education are here to present and discuss their work and the latest development in science, mathematics and education research. I very much hope that this conference will synthesize new ideas and create new partnerships in this field of research at inter-institutional level with multidisciplinary nature.

I am fully confident that IPCSM 2013 will be a success with the support of each and every one of you. I am confident that the best social networking and intellectual discourse will be achieved throughout the conference.

I hope that you will visit the faculty again on future occasions.
Thank you.

Prof. Dr. Mustaffa b. Ahmad



MESSAGE
Chairman, IPCSM 2013

Assalamu alaikum wa Rahmatullahi wa Barakatuh

On behalf of Universiti Pendidikan Sultan Idris (UPSI), it gives me pleasure to welcome all participants to the International Postgraduate Conference on Science and Mathematics 2013 (IPCSM 2013). With the theme of 'Research in Science and Mathematics Catalyse Sustainable Future' or in Bahasa Malaysia, 'Penyelidikan Sains dan Matematik Pemangkin Kelestarian Masa Depan', the organization of this conference has highlighted the importance of utilizing emerging advanced technologies in science and mathematics research and their increased impact in new discovery.

The multidisciplinary nature of science and mathematics research needs effective collaboration between researchers of various disciplines. Drug discovery and development in biology is a complex process and requires multidisciplinary approach, and it cannot be successfully carried out alone. It goes same as others for chemistry, biology, physics and mathematics.

Conference such as this can provide a platform for researchers in various disciplines research to network and thus promote future collaborations in particular areas of expertise. Thus, this meeting of minds serves to provide an avenue for Malaysian scientists especially young scientists, to share their research findings and experiences with their colleagues from different parts of the world.

Last but not least, I would like to express my utmost gratitude and appreciation to the organizing committee for their commendable efforts and I wish the conference an astounding success.

Thank you

Dr. Azmi b. Mohamed



IPCSM 2013 Organizing Committee

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 Dr. Haniison Abdullah
 Dr. Norhayati Ahmad
- Dr. Lee Tean Tien (K)
 Dr. Soen Cui Si Niang
 En. Ahmad Suplian Hj. Abdallah

Programme Tentative

Date	Time (h)	Programme
05/10/2013 (Saturday)	0800 – 0830	Arrival and registration
	0830 – 0900	Official speeches Dean Faculty of Science and Mathematics IPCSM2013 Chairman
	0900 – 0945	Keynote 1 – Prof Dr Kristian Sugiyarto
	0945 – 1015	Coffee break / Poster session
	1015 – 1245	Parallel session I (E-Learning room 1 - 7)
	1245 – 1400	Lunch
	1400 – 1530	Parallel session II (E-Learning room 1 - 7)
	1530 – 1615	Coffee break / Poster session
	1615 – 1700	Keynote 2 – Prof Datuk Dr Halimatun Hamdan
	1700 – 1745	Closing and prize giving ceremony by Vice-Chancellor

Scientific Programme

Room 1 (Chemistry)

Session 1	
Chairperson: Dr. Eli Rohaeti	
Time	Presenter
10.15-10.30	OR-001: Synthesis of Dual Herbicides-Interrelated Layered Double Hydroxide Nanohybrid
10.30-10.45	OR-002: Direct Determination Of Trace Concentration Of Lead In Fresh Water Samples By Adsorptive Cathodic Stripping Voltammetry Of A Lead-Citrate Complex
10.45-11.00	OR-003: Application Of <i>N,N'</i> -Bis(2-Hydroxyacetophenone) Ethylenediamine For Electrochemical Detection Of Transition Metal Cadmium, Copper, Lead And Zinc Ions
11.00-11.15	OR-004: Synthesis of Multifunctional Porphyrins via Condensation Reaction
11.15-11.30	OR-005: Structure-Antioxidant Activities Relationship Analysis Of Benzalacetone's Derivatives
11.30-11.45	OR-006: Aporphine Alkaloids From Leaves Of <i>Aescodaphne peduncularis</i>
11.45-12.00	OR-007: Voltammetric Measurement Of Copper(II) Using Zinc Layered Hydroxide-2(3-Chlorophenonyl) Propionate Nanocomposite Modified Multiswalled Carbon Nanotube Composite Paste Electrode
12.00-12.15	OR-008: Eggshell, Coconut Tree Sawdust, And Sugarcane Bagasse As Low-Cost Adsorbents For Cu(II) Removal From Aqueous Solution
12.15-12.30	OR-009: Adsorption Of Pb(II) From Aqueous Solutions Using Durian Tree Sawdust, Oil Palm Empty Fruit Bunch And Coconut Coir
12.30-12.45	OR-010: Surface Complexation Model Of The Sorption Of Phosphate Ions By Montmorillonite
Lunch	
Session 2	
Chairperson: En. Shrikh Ahmad Izuddin Sheikh Mohd Ghazali	
14.00-14.15	OR-011: The Effect Of Unsaturated Fatty Acids On The Size And Encapsulation Efficiency Of Nanostructured Lipid Carrier (NLC)
14.15-14.30	OR-012: Factorial Analysis on the Migration of Bisphenol A from Polycarbonate Baby Bottles via Modified European Standard Method
14.30-14.45	OR-013: Indole Alkaloids From The Roots Of <i>Kopra Singaporensis</i> Radl. (Apocynaceae)
14.45-15.00	OR-014: Determination of Toxic Heavy Metals in Herbal Medicines of Malaysian Market- A Preliminary Study
15.00-15.15	OR-015: XRF Analysis Of Trace Element In River Bank Soil By The Effect Of Electrokinetic-Assisted Phytoremediation
15.15-15.30	OR-016: Bacterial Cellulose From Rice Waste With Addition Of Chitosan

Room 2 (Chemistry)

Session 1	
Chairperson: Dr. Hari Sutrisno	
Time	Presenter
10.15-10.30	OR-017: Adsorption Of Technical Direct Red Dye By <i>Fouadit Acid</i> Kopyok Banana Peels
10.30-10.45	OR-018: Hermagins Type Of Aporphine Alkaloids From <i>Aescodaphne Perakensis</i>
10.45-11.00	OR-019: Review Of LiNiO ₂ System And Their Derivative As Cathode For Lithium Ion Batteries
11.00-11.15	OR-020: Studies On The Hydrogen Evolution Reaction On Fe-Co/S, Fe-S/S And Co-Ni/S Electrodes
11.15-11.30	OR-021: Adsorption And Photocatalysis Of Nicotine In Cigarettes Smoke Using TiO ₂ Embedded In Activated Carbon From Tobacco (Nicotiana Tabacum) Stem Waste
11.30-11.45	OR-022: Effect Of DOPE-PEG 2000 on Oleic and Linoleic Fatty Acid Liposomes
11.45-12.00	OR-023: Pore Formation and Doping Process on the Sol Gel Synthesis of Nanocrystalline Nitrogen-doped Titania
12.00-12.15	OR-024: Raman spectroscopy Study of carbon nanotube prepared using ferrocene-fermented lipo-chemical vapour deposition
12.15-12.30	OR-025: Molybdenum Complexes with Amino Acids as Antihypertensive Agent: Preparation and Spectroscopic Studies
12.30-12.45	OR-026: DNA Binding Properties of Ruthenium(II) Polypyridyl Complexes
Lunch	
Session 2	
Chairperson: Prof. Endang Wudjantanti Laksono	
14.00-14.15	OR-027: Electronic States of Vanadium-doped Anatase TiO ₂ by First Principles Calculations
14.15-14.30	OR-028: Effect of Electron Beam Irradiation on the Molecular Weight of Hydrolyzed Collagen
14.30-14.45	OR-029: Conductivity Behaviour Of Polysulfamide-Methane Sulfonic Acid Gel Polymer Electrolyte In Tin-Air Battery
14.45-15.00	OR-030: Solar Photocatalytic Degradation Of Azo Dye New Cocaine In Solution With Zinc Oxide Sodium Alginate Beads
15.00-15.15	OR-031: Solar-Photocatalytic Degradation of Phenol Using Zinc Oxide Prepared by Precipitation Method
15.15-15.30	OR-032: Effect Of Inconsistent Organic Loading On The Development Of Aerobic Granulation In Sequencing Batch Reactor

Keynote 1

Speaker Profile

Prof. Drs. Kristian H. Sugiyarto, M.Sc., Ph.D.
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BIOGRAPHICAL DETAILS

Kristian Sugiyarto gained his Drs. degree from Yogyakarta State University (UNS), Indonesia in 1978, while appointed to the academic staff of UNS (1979). Kristian undertook M.Sc. program in 1984-1987, and then continued to the Ph.D. program in 1989-1992, both at the Department of Inorganic Chemistry, the School of Chemistry, UNSW, Australia, under the supervision of Prof. H. A. Goodwin. Kristian then undertook a three-six-month post-doctoral research, again with Prof. H.A. Goodwin, 1995-1997. Several international publications dealing with *gou-oxovaner* in iron(II) resulted from the research. Kristian also undertook another six-month research in structural study by EXAFS analysis with Prof. Makoto Kurihara at Shizuoka University and with Prof. Saito, A. at Tokyo Gakugei University, 2002-2003. Recently, Kristian undertook a four-month Academic Recharging Program for doing palladium complex with Prof. Stephen B. Colbran at the School of Chemistry, UNSW, Australia, 2009-2010.

RESEARCH INTERESTS

Kristian Sugiyarto's research expertise is in *transition metal chemistry and misconception in chemistry*

- Magnetic and electronic spectral properties of first-row transition metal complexes
- Misconception observed in chemistry textbooks and the users, students and teachers.

Misconception in Chemistry Textbooks and Teachers as Users: Case Study on the concepts of Quantum Numbers and Electronic Configurations for Senior High School Level in Yogyakarta

Kristian H. Sugiyarto¹, Heru Pratomo, and Togu Gultom
Department of Chemistry Education, Faculty of Mathematics and Science
Yogyakarta State University, INDONESIA

ABSTRACT

Chemistry textbooks for senior high school commonly used by chemistry teachers as well as students have been reviewed on the concepts of quantum numbers and electronic configurations. A number of six textbooks and thirty teachers from fifteen senior high schools were purposively taken as samples. Typically common misconceptions were found to strike the authors as well as the teachers. In the case of quantum numbers $l = 1$, the "ordering" of $m_l = 1, 0, -1$ is mistakenly associated with alphabetic ordering of p orbitals: p_x, p_y, p_z , for five of the six textbooks; while the other one mistakenly stated that "it is impossible to know the relationship between the two, and thus cartesian-axes labels are just arbitrarily". This idea may be associated with the problem in alphabetic ordering for d orbitals. No doubt, that the authors have no knowledge at all of the solution of Schrodinger equation. In accordance to Hund's rule for the magnetic spin quantum number, five of the six books stated that the unpaired electrons are to be (m_s) of $+\frac{1}{2}$ (labelled with \uparrow), and only the other one stated that the unpaired electrons can also be (m_s) of $-\frac{1}{2}$ (\downarrow). It would potentially lead to misconception. In writing electronic configurations of elements it is always associated with *aufbau* principle due to increasing $(n + l)$ of Madelung. All textbooks mistakenly stated that the order of increasing energy of orbitals for all elements follows the *aufbau*-Madelung order, $1s < 2s < 2p < 3s < 3p < 4s < 3d < 4p < \dots$. In the case of $(3)d$ block, all textbooks teach the electronic configurations of $[Ar] 4s^1 3d^5$, though four of them stated that the configurations of $[Ar] 3d^5 4s^1$ is also preferably allowed, since it is known that $4s$ electrons are lost first before d electrons during ionization. Thus, an odd statement appears that an electronic configuration could be written in two ways, one on the basis of *aufbau* ordering and the other on the basis of shell (principle quantum number) ordering. These textbooks introduced the terms of the last and the n^{th} electron to be associated with the corresponding quantum numbers, and this leads to serious further misconceptions. The ordering energy of orbitals including *aufbau* ($n + l$) pattern is actually only true for the first twenty elements, and quantum mechanics calculation of Hartree-Fock reveals that the energy of $(n-1)d$ orbitals is always lower than that of n orbital.

Similar misconceptions were also observed for teachers as users of the textbooks. In accordance with Hund's rule for the magnetic spin quantum number, only seven out of thirty three teachers stated purposely that the unpaired electrons can be (m_s) of $+1/2$ or (m_s) of $-1/2$, however, all teachers always provide (m_s) of $+1/2$ as the correct answer. A number of nine teachers stated that the energy of orbitals $3d$ is lower than that of $4s$, but the electronic configurations of transition elements are written absolutely following *orbital* as $[\text{Ar}] 4s^1 3d^{1-9}$. Thus, even though some teachers seems to have different ideas with the textbooks, they are inconsistent and not showing significant independency. It might be suggested that the chemistry textbooks must be revised to the correct concept by introducing the solution of Schrödinger equation and the correct order of energy of orbitals. The details of misconceptions would be discussed in this paper.

Key words: misconception, quantum numbers, electronic configuration.

^{*)} corresponding authors.

Keynote 2

Speaker Profile

Prof. Datin Hafimatun, HAMDAN, PH.D., F.A.Sc.

Professor of Chemistry
Vice Chancellor,
University Malaysia of
Cyberjaya Science & Engineering (UmMy)
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http://www.zenodo.org/ummy, www.zenodo.com

Prof. Hali has successfully promoted her research and innovative activities globally. She received her Ph.D in Physical Chemistry from University of Cambridge UK in 1989 and was UM's first woman Professor at 40. She received her M. Sc degree from Marshall University, USA (1983) and B. Sc degree from Indiana University, USA (1979). She pioneered the Zeolites and Nanostructured Materials Research in Malaysia in 1990. To date, she has led 25 research programmes and 80 projects. Hali's work is focused on the synthesis of silica-based nanostructured materials, namely aerogel, zeolites and mesoporous materials, synthesized from rice husk waste. She developed the technology of one-step conversion of pure amorphous silica from rice husk. Her research is about sustainable, green and clean processes by molecular manipulation to synthesize new nanostructured materials, systems and complexes via heterogeneous catalytic reactions.

Prof.Hali has successfully demonstrated that in-depth understanding in the chemistry of elements and molecules is crucial, which may be further applied to manipulate structures and physical properties of local natural resources and create novel, commercially viable nano materials with enhanced properties. Her scientific research and scholastic work has received recognitions, including the prestigious Merdeka Award 2009 for the Health, Science and Technology Category.

Prof. Hali was an academic in UTM for 31 years (1981-2012). In 2010-2012, she was awarded to Ministry of Science, Technology and Innovation, to head the National Nanotechnology Directorate. She is a fellow of Academy Sciences Malaysia, Institut Kimia Malaysia and Malaysian Scientific Association, member of the National Science Research Council, National Malaysia Board, Malaysian Professor Council and president of Malaysia Nanotechnology Association. She is currently the Vice Chancellor of University Malaysia of Cyberjaya.



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