Editorial

H. Idriss

Chemistry Department,
University of Aberdeen,
Aberdeen, AB24 3FX, UK

and

School of Engineering,
Robert Gordon University,
Aberdeen, AB10 1FR, UK
E-mail: h.idriss@abdn.ac.uk

R. Schaub

School of Chemistry,
University of St. Andrews,
St. Andrews, KY16 9ST, Scotland, UK
E-mail: rs51@st-andrews.ac.uk

Biographical notes: Hicham Idriss is Aberdeen Energy Futures Chair and Professor of Chemistry at the University of Aberdeen and Robert Gordon University, UK since 2008. He is also Adjunct Professor at the Department of Chemical Engineering, Louisiana State University in the USA. Prior to 2008 he was Associate Professor at the Department of Chemistry, the University of Auckland in New Zealand where he worked for 13 years. He served as a member of the New Zealand National Energy Panel who delivered the 2020 Energy report to the New Zealand Government in 2008. He has obtained his BSc (1984), MSc (1985), PhD (1987) and habilitation (1997) from the University of Strasbourg in France and has postdoctoral and research associate positions at the University of Delaware and University of Illinois, Urbana (USA). He is the author and co-author of over 140 scientific papers and has served/is serving at the editorial board of scientific journals including *Applied Catalysis A*, *Catalysis Today* and *Catalysis Survey* from Asia. His main interest is surface science and catalysis on metal oxides and their interface with transition metals at the fundamental and applied levels.

Renald Schaub has carried out PhD studies at the Department of Physics of the Swiss Federal Institute of Technology in Lausanne (EPFL). Subsequently, he held the post of PDRA and later Senior Researcher at the Interdisciplinary Nanoscience (iNano) Center of the University of Aarhus, Denmark. In early 2006, he was appointed Hirst Fellow by the new joint Research School of Chemistry, EaStCHEM, established between the Universities of Edinburgh and St. Andrews. And recently, he was nominated to a Lectureship position at St. Andrews. He exploits high-resolution scanning probe microscopies to study fundamental processes related to a broad range of activities with a common objective: to better understand fundamental principles and mechanisms involved in the chemistry and physics at surfaces. Research topics of interest are nano-catalysis, epitaxial graphene, and molecular switches.

Dear reader of this issue,

We introduce to you a collection of original papers representative of the research performed in Scotland in the field of Nanotechnology. Research in this field is carried out in several laboratories and covers the areas of Nanomaterials, Catalysis, Surface Science, Materials Science and Computation.

The special edition contains contributions on novel Optical Characterisation of Carbon Nanotube Growth techniques on a micro-scale heater using chemical vapour deposition and on computational and experimental studies of high pressure studies of metal organic framework materials from the University of Edinburgh. Here we learn that different growth phases can be identified by real-time video recording of dense multiwalled nanotubes (MWNT) bundle growth or by real-time Raman spectroscopy of the spectral range of G and D lines (Ek-Weis et al. – work supported by EaStCHEM and the WCU program of the MEST (R31-2008-000-10057-0)). We also learn that that by combining experimental and theoretical techniques we can demonstrate that GPa pressures can be used successfully to explore the potential energy surface landscape of Metal Organic Framework Materials (MOFs) (Moggach et al.).

Other contributors presented the growth and characterisation of titanium sulphide nanostructures by surface-assisted vapour transport methods to grow nanometric flower-like structures on titanium-coated silica substrates from the University of Glasgow (Denholme et al. work supported by EPSRC and WestCHEM).

The University of St. Andrews presented contributions on Colloidal Syntheses of FePt nanoparticles that have high potential for data storage, catalysis and a wide range of biomedical applications (by Chen and André, supported by EaStCHEM and the Canon Foundation in Europe) and a review outlining a decade of Electron Microscopy studies of Nanomaterials by Zhou and Greer from the University of St. Andrews where many interesting HRTEM studies are presented for MOFs, zeolites, anodic metal oxides, mesoporous single crystalline metal oxides, fullerene nanowires, metal nanowires and nanotubes of metals and metal oxides (EPSRC supported facilities). Gold nano-particles supported on hematite and magnetite Catalysts for selective Hydrogenation of Nitro-aromatics are studied by Cárdenas-Lizanaa et al., in particular HRTEM and XPS demonstrated the encapsulation of Au in the Fe_3O_4 matrix after Temperature Programmed Reduction to 423 K, which inhibited hydrogenation rate (Heriot-Watt University – work supported by EPSRC).

The photoreaction of ethanol to hydrogen over nano-particles of Au on the semiconductor TiO_2 catalysts where the evidence points to synergistic effect between the anatase and rutile phase enhancing the reaction rate by Waterhouse et al., and a review article on photoreaction over single crystal and nanoparticles of TiO_2 with emphasis on hydrogen production that covers the fundamentals of the reaction as well as the effect of noble metal particle size on the electron transfer needed for hydrogen ion reduction to molecular hydrogen (by Nadeem et al.), are both contributions are from the University of Aberdeen and Robert Gordon University at the Energy Futures Centre (funded by both Universities and Aberdeen City Council).

The guest editors would like to extend their thanks to all authors who contributed to this special issue.