EDITORIAL

Catalysing progress

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Editorial

Catalysing progress

Anna Demming

Examples of the merits of blue-sky research in the history of science are legion. The invention of the laser, celebrating its 50th anniversary this year, is an excellent example. When it was invented it was considered to be ‘a solution waiting for a problem’, and yet the level to which it has now infiltrated our day-to-day technological landscape speaks volumes. At the same time it is also true to say that the direction of research is also at times rightly influenced by the needs and concerns of the general public. Over recent years, growing concerns about the environment have had a noticeable effect on research in nanotechnology, motivating work on a range of topics from green nanomaterial synthesis [1] to high-efficiency solar cells [2] and hydrogen storage [3].

The impact of the world’s energy consumption on the welfare of the planet is now an enduring and well founded concern. In the face of an instinctive reluctance to curtail habits of comfort and convenience and the appendages of culture and consumerism, research into renewable and more efficient energy sources seem an encouraging approach to alleviating an impending energy crisis. Fuel cells present one alternative to traditional combustion cells that have huge benefits in terms of the efficiency of energy conversion and the limited harmful emissions. In last week’s issue of Nanotechnology, Chuan-Jian Zhong and colleagues at the State University of New York at Binghamton in the USA presented an overview of research on nanostructured catalysts in fuel cells [4]. The topical review includes insights into the interactions between nanoparticles and between nanoparticles and their substrate as well as control over the composition and nanostructure of catalysts. The review also serves to highlight how the flourishing of nanotechnology research has heralded great progress in the exploitation of catalysts with nanostructures ingeniously controlled to maximize surface area and optimize energetics for synthesis procedures.

One man who was well aware of the role of nanostructured catalysts in the progress of material science research was the late Ulrich Gösele, director at the Max-Planck-Institut für Mikrostrukturphysik Halle, who passed away at the age of 60 on 8 November, 2009. Ulrich Gösele published over 750 papers of premium calibre research that have collectively been cited over 20,000 times. His research output includes a cornucopia of excellent work published in Nanotechnology, amongst which are a number of papers detailing the deft manipulation of nanocatalysts to control the quality and structure of nanomaterials [5–8]. Ulrich Gösele was a pioneer in nanoscience. In 1991, when the nanotechnology revolution was little more than a portentous rumble, he published a seminal report examining the effect of quantum confinement on the optical properties of silicon nanowires [9]. While we lament the loss to the community, we have much to celebrate in the insights his legacy has provided for the progress of materials science.

It would be unwise to assume that science will or can ultimately advance in such a way as to allow ample means to indulge an unrestrained appetite for consumerism and energy consumption. As with most things, a balanced approach, considering solutions to the problem from many angles, seems sensible. Nonetheless, a browse through the latest literature leaves much cause for optimism for the positive role science can play in improving and sustaining our lifestyle.
References