J Solid State Electrochem (2008) 12:1183
DOI 10.1007/s10008-008-0555-x

EDITORIAL

**Frank Marken**

Published online: 22 April 2008


Carbon and carbon composites [1] are ubiquitous and essential in electrochemistry [2], and they present a major field of study and development. New types of carbon materials such as nano-tubular or fullerene-based materials, diamond and amorphous tetrahedral carbons, hydrothermal carbons, pyrolysed film materials, graphene sheets and ribbons, etc. become ever more accessible, and they constitute very interesting new building blocks for the design of novel electrode and sensor surfaces. Surely, there will be a future evolution of ideas and designs going from simple carbon electrode surfaces to chemically modified surfaces, then on to nano-structured assemblies, and finally to functional surfaces where moving parts and switches constitute highly selective sensors or interfacial actuators [3]. There is a long way to go though.

This special issue is summarising the field of modified carbon materials with particular emphasis on electroanalysis applications. Every type of carbon surface (e.g. basal plane, edge plane, diamond surfaces, bamboo-like carbon nanotubes, etc.) exhibits chemically distinct surface sites, and this results in a variety of approaches to chemically alter the surface. Both the rate of interfacial electron transfer and the selectivity towards specific analytes depend on this modification process. In the first part of this special issue, review chapters on the use of modified carbons in glassy and paste electrodes, in composite and microelectrodes, and processes for the chemical modification of carbon and diamond surfaces are presented. New chemical tools for chemical surface modification are constantly being developed and improved, and these reviews will provide readers with state-of-the-art insights into new methods and their advantages. The following articles treat screen-printed carbon, pyrolysed thin films, surface treated carbon nanotubes, carbon ceramic and fullerene composite electrodes. These represent only a fraction of the currently emerging carbon electrode materials, but they are important contributions to the design and understanding of electrode surfaces. Finally, several contributions investigate metal nanoparticle and metal oxide modified carbon electrodes and their potential applications.

## References

1. Pierson HO (1993) Handbook of carbon, graphite, diamond and fullerenes. Noyes, New Jersey
2. McCreery RL (1991) Electroanal Chem 17:221
3. Balzani V, Credi A, Venturi M (2008) ChemPhysChem 9:202

F. Marken (✉)
Department of Chemistry, University of Bath,
Claverton Down,
Bath, BA2 7AY, UK
e-mail: f.marken@bath.ac.uk