

# Preface

Graphene, a one-atom thick individual planar carbon layer, has been reported to possess a range of unique and exclusive properties and is consequently being explored in a plethora of scientific disciplines. Although theoretically graphene has been scientifically investigated since the 1940s and was known to exist since the 1960s, the recent burst of interest can be correlated with work by Geim and Novoselov in 2004/2005, who reported the so-called “scotch tape method” for the production of graphene in addition to identifying its unique electronic properties. Thereafter, the 2010 Nobel Prize in Physics was awarded jointly to Geim and Novoselov “*for groundbreaking experiments regarding the two-dimensional material graphene*”. As a result there is a global pursuit to find new ‘industrial scale’ methodologies for the facile fabrication of pristine graphene and other graphene family members. Furthermore, graphene and related structures are being extensively incorporated into an ever diversifying range of applications across many areas in the search for greatly improved device performance.

One area which receives significant interest is the field of electrochemistry where graphene has been reported to be beneficial in various applications ranging from sensing through to energy storage and generation and carbon-based molecular electronics.

This handbook aims to provide readers with a fundamental introduction into electrochemistry, allowing one to be able to design and interpret experiments utilising graphene. Subsequent chapters consider current literature reports regarding fabricating graphene, utilising graphene as an electrochemical sensor and its impact on energy storage and production. Due to the range of currently available graphenes and those that will likely be fabricated in the near future along with the wide applications of graphene in electrochemistry, the area is truly fascinating.

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Dale A. C. Brownson  
Craig E. Banks

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Brownson, D.A.C.; Banks, C.E.

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