Department of Chemistry

Postgraduate Research Night

Book of Abstracts

July 22\textsuperscript{nd}, 1998
Introduction

Welcome to the inaugural Department of Chemistry Postgraduate Research Night.

This is the first of what we hope will become a long running series of annual events in our Department. Our intention is to provide the community with an opportunity to learn about some of the research being carried out in the Department. Most of the posters on display are of work currently in progress. Hence, students who have either just begun or are in the writing up stages of their work were not obliged to present on this night.

We hope you enjoy meeting with our students and learning about their work.

Andrea Bishop  
(Postgraduate Representative)

Patrick Perlmutter  
(Coordinator of Postgraduate Studies)

Acknowledgements

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Complex In Acetonitrile With Large And Small Cations

Alan M. Bond, Wujian Miao, Colin L. Raston, Christian A. Sandoval, David G. Humphrey and John C. Eklund

Department of Chemistry, Monash University, Clayton, VIC 3168, Australia

Abstract

The electrochemical behaviour of the microcrystalline (p-benzylcalix[5]arene)$_2$ ⊂ C$_{60}$ - (C$_6$H$_5$Me)$_8$ complex directly attached to the working electrode surface has been investigated in MeCN (acetonitrile) containing electrolytes with large (TBA$^+$, tetrabutylammonium) and small (Li$^+$, Na$^+$, Ba$^{2+}$) cations. Two chemically reversible one-electron processes and an irreversible intercalation process were observed in the presence of large and small cations, respectively. Additionally, the sixth reduction peaks of solid C$_{60}$, in the presence of a trace of water, were for the first time observed in MeCN using TBA$^+$ and Li$^+$ as electrolytes at room temperature. In both cases, the sixth wave showed enlarged peak-current values compared to its previous reduction peaks, which may be explained by a multiple electron-transfer and protonation mechanism. Similarly, this mechanism could explain the enhancement of the fifth reduction wave in the cyclic voltammograms of solid (p-benzylcalix[5]arene)$_2$ ⊂ C$_{60}$ - (C$_6$H$_5$Me)$_8$ complex. In contrast to CTV (cyclotriveratrylene) - (C$_{60}$)$_n$ (n = 1, 1.5) complexes, no free C$_{60}$ anions were produced in the processes of reduction in MeCN with TBA$^+$ cation.