

Invited Lecture

Title: Surface analysis for industrial and biomedical applications:
A ToF-SIMS perspective of biomolecules

Speaker: Dr. Ivan Kempson
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Date & Time: 10:00 -11:30 June 11, 2014

Venue: Room 223, IPE Mansion

Introduction

Dr. Ivan Kempson received his doctorate degree (Materials) from the Ian Wark Research Institute, University of South Australia in 2004. Before he relocated to the Ian Wark Research Institute, he has visited many well-known international research institutes. He is the author of 2 book chapters, 5 review articles and 44 Journal articles, with *h-index* = 19; Editor of Scientific Reports, Nature Publishing Group and a member of the Program Advisory Committee for the Australian Synchrotron. His research revolves around bio-inorganic chemistry with emphasis on nanostructures and biological interfaces. One highlight of his researches is on biomonitoring to find different components in hair that can be accurately measured to monitor what is happening within our bodies.

In this presentation, he will give an overview of the application of Time-of-Flight Secondary Ion Mass Spectrometry (ToF-SIMS) in the analysis of organic molecules with particular interest in pharmaceutical and industrial applications. It aims to give an introduction to the technique to describe its principles, followed by several examples highlighting the techniques' capabilities and weaknesses. ToF-SIMS is especially powerful in the chemical and compositional analysis of surfaces, being sensitive to sub atto-mol quantities in a surface monolayer. While ToF-SIMS has long been recognised for utility in imaging or molecular and elemental constituents of a surface, it is gaining increasing recognition for being sensitive to structural information. This can be now developed for use in detecting protein misfolding and relating molecular structure to functional activity.