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Robert H. Temperton, James N. O'Shea, David J. Scurr

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On the suitability of high vacuum electrospray deposition for the fabrication of molecular electronic devices

Robert H. Temperton^a, James N. O'Shea^a, David J. Scurr^b

^a*School of Physics, University of Nottingham, Nottingham NG7 2RD, UK*

^b*School of Pharmacy, University of Nottingham, Nottingham NG7 2RD, UK*

Abstract

We present a series of three studies investigating the potential application of high vacuum electrospray deposition to construct molecular electronic devices. Through the use of time of flight secondary ion mass spectrometry we explore the use of this novel deposition technique to fabricating multilayer structures using materials that are compatible with the same solvents and films containing a mixture of molecules from orthogonal solvents. Using x-ray photoelectron spectroscopy we study the deposition of a polymer blend using electrospray and find evidence of preferential deposition of one of the components.

Keywords: Electrospray Deposition, ToF-SIMS, XPS, Molecular Electronics, Polymers

1. Introduction

Vacuum electrospray deposition (ESD) is an emerging technique that has allowed researchers to study complex molecules on surfaces, *in-situ*, using a vast array of analytical techniques requiring high vacuum including various photoemission[1, 2, 3] and scanning probe techniques[4, 5]. Early examples of work using high vacuum ESD studied the bonding of molecules used in dye sensitised solar cells such as the benchmark N3 sensitiser dye on the titanium dioxide surface[1]. The technique has also been applied beyond

Email addresses: robert.temperton@nottingham.ac.uk (Robert H. Temperton), J.Oshea@nottingham.ac.uk (James N. O'Shea)

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