Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Plasma Enhanced Chemical Vapour Deposition on Cylic Olefin Copolymers from Tetraethyl Orthosilicate and Acrylic Acid for Biosensor Applications CONOR COYLE, National Centre for Plasma Science and Technology (NCPST), Biomedical Diagnostics Institute (BDI), RAM P. GANDIRAMAN, (BDI), CHANEL HAYDEN, (NCPST), VLADIMIR GUBALA, (BDI), DAVID GAHAN, (Impedans), DAVID E. WILLIAMS, (BDI), STEPHEN DANIELS, PAUL SWIFT, (NCPST) — Functionalisation of chip surfaces for bioassays in point of care diagnostics require covalent immobilisation of the capture antibody. Deposition of carboxylic functionalities is achieved using plasma enhanced chemical vapour deposition of acrylic acid using tetraethyl orthosilicate (TEOS) as an adhesion layer to cyclic olefin copolymer substrates. TEOS has been found to act as a network building layer for good functionalisation retention. A comparison between direct deposition of acrylic acid and using TEOS as an adhesion layer demonstrated that the use of TEOS as a network building layer reduced the non specific binding significantly. Correlation between plasma phase and surface characteristics are investigated. Surfaces were characterised using; water contact angle measurements, ATR Fourier-Transform Infrared Spectroscopy, and attachment of amino terminated ssDNA. The plasma phase has been investigated through optical emission spectroscopy, mass spectrometry and Langmuir probe measurements.

Conor Coyle
Dublin City University (DCU), National Centre for Plasma Science and Technology (NCPST), Biomedical Diagnostics Institute (BDI)

Date submitted: 12 Jun 2010 Electronic form version 1.4