Development of a high intensity electrospray source for UHV deposition of large functional molecules for in-situ STM studies

Daniel Warr, Luis Perdigão, Jonathan Blohm, Harry Pinfold, Mark Barrow, Alex Colburn, Giovanni Costantini

Department of Chemistry, University of Warwick, Gibbet Hill Road, Coventry, CV4 7AL, UK

Electrospray ionisation beam deposition (ESI-BD) is quickly becoming a versatile methodology for surface deposition of large thermally labile molecules and their in-situ investigation by means of high-resolution analytical techniques\(^1\). ESI-BD has recently been used to demonstrate intact deposition and study of a wide range of molecules from fragile molecular magnets\(^2\) to porphyrin nanorings\(^3\).

In this work we present a new design for a high efficiency, high transmission ESI-BD system which will offer the ability to study complex systems with the ultimate spatial resolution of scanning tunnelling microscopy (STM). Molecules will be delivered from solution in atmospheric conditions to a sample surface located in ultra-high vacuum (UHV).

![3D CAD model section view of the ESI-BD system.](image)