IEUVI Optics Contamination and Lifetime Technical Working Group

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BOC EDWARDS

Aim

- Goal is essentially to understand the adsorption characteristics of various types of hydrocarbon species on multilayer mirror optics under under 13.5nm (or equivalent) radiation.
  - e^- gun
  - Synchrotron radiation
  - Pulsed photon source

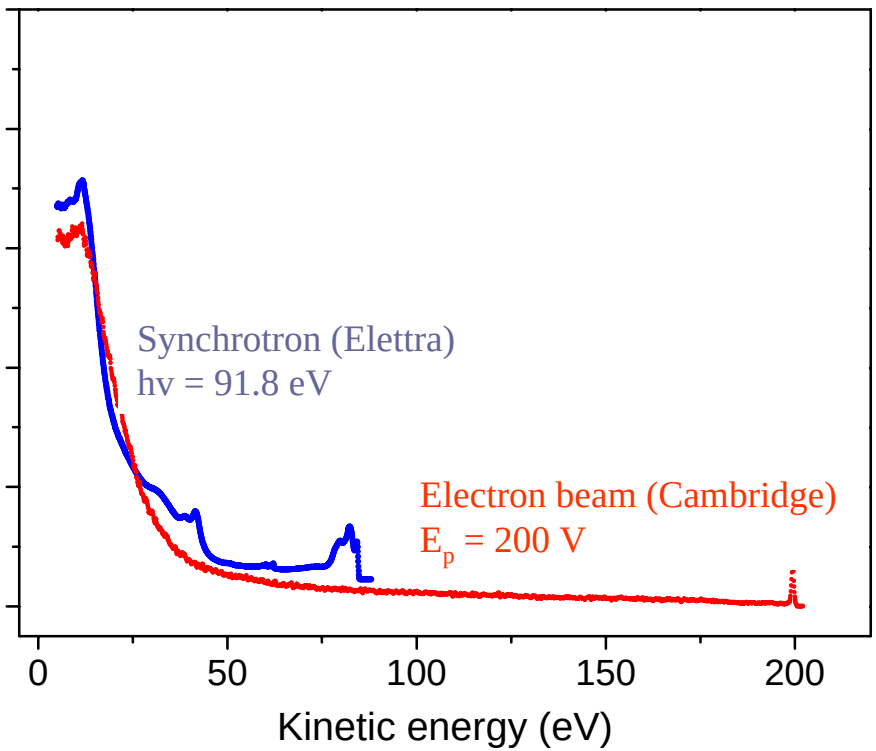
BOC Edwards Plan of Work

- Investigations to include e^- gun stimulation at Cambridge University (ongoing), synchrotron radiation studies at Elettra syncrotrone, Trieste (ongoing) and pulsed photon source (TBD).

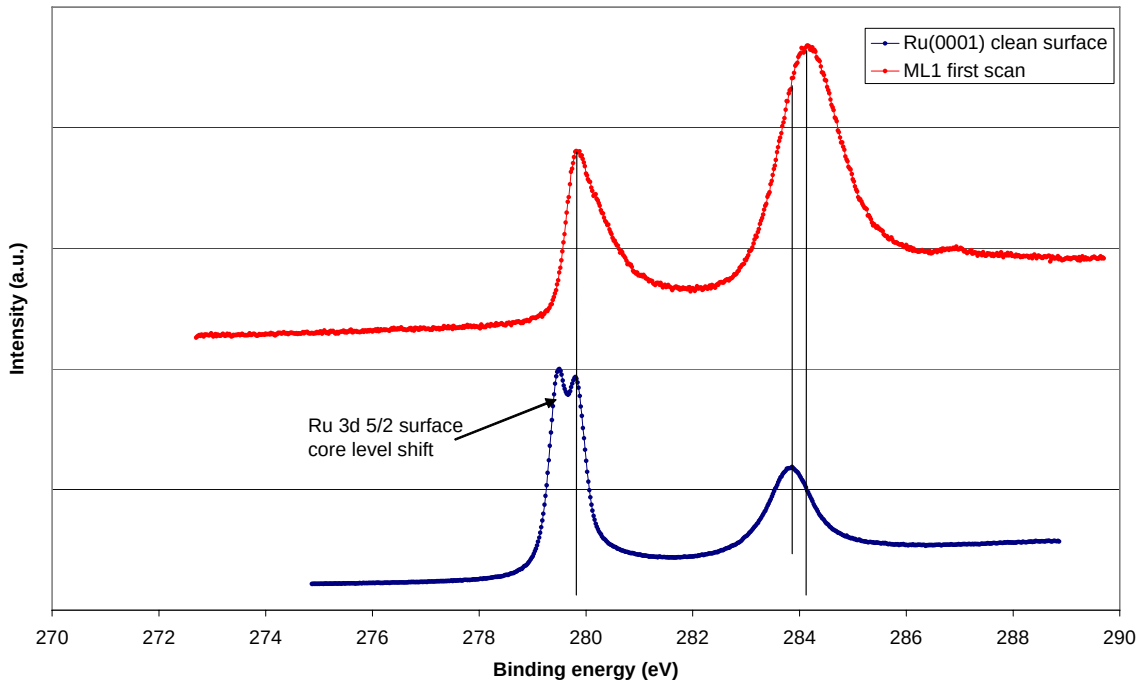
- Initial investigations focussing on fundamental surface science studies of single crystal Ru(0001) and polycrystalline Ru foil will then move to capped MLM

Results of Electron Stimulation

- Comparison of the profile of secondary electrons between 13.5 nm EUV photons and low energy electron beam
- Electron gun stimulation at 0.2mW/mm^2 of toluene at (true) 1x10^{-9} Torr partial pressure results in 1nm carbon growth on Ru(0001) in approximately 80 hrs
- Characterisation of primary e$^-$ beam energy effect on carbon growth characteristic



Recent Synchrotron Studies



- **Comparison between clean Ru(0001) single crystal (showing SCLS) and first scan of ML1 sample after installing into vacuum**
- **Angle resolved XPS measurements have also been performed on Ru(0001) and fresh ML1 sample to compare secondary electron profiles – further detailed analysis ongoing.**