METASTABLE STATES ARISING FROM THE ABLATION OF SOLID COPPER

ANNA ANDREJEVA, JOE HARRIS, TIM WRIGHT, School of Chemistry, University of Nottingham, Nottingham, United Kingdom.

Laser ablation is a popular method for generating metal atoms so that metal clusters, complexes, and molecules may be investigated in gas phase spectroscopic studies. However, the initial production of a highly energetic metal plasma from the surface of a solid metal target can produce atoms which are not in their ground electronic state, and consequently atomic spectra can become quite complicated due to transitions arising from metastable atomic excited states which remain populated on the experimental timescale.

Presented herein are details of the laser vaporisation source in use by our group. Spectra of atomic copper are presented, recorded via (1+1’) and (2+1) resonance enhanced multiphoton ionisation (REMPI) spectroscopy. The energetic regions examined are expected to correspond to the \((4s^2 4p)^2P \rightarrow ^2S\) and the \((4s^2 nd)^2D \rightarrow ^2S\) Rydberg series respectively, but the observed spectra also exhibit many additional contributions which are found to arise from electronically excited states, and these will be discussed.