

X-RAY PHOTOELECTRON SPECTROSCOPY (XPS) FOR IN-DEPTH STUDY OF METAL COMPLEXES. Iraklii I. Ebralidze, E. Bradley Easton. Ontario Tech. University, Faculty of Science, Materials Characterization Facility. 2000 Simcoe Street North, Oshawa, ON, L1G 0C5, Canada. (Iraklii.Ebralidze@ontariotechu.ca)

The progress made recently in material science and forensics is largely attributed to the advancement of instrumental techniques that enable the analysis of matter at the nanoscale. X-ray photoelectron spectroscopy (XPS) is a powerful surface analytical tool that allows accurate determination of ligand-to-metal ratios, oxidation states of metals, and even the thickness of layers formed on the surface. Non-destructive nature of XPS analysis enables obtaining high-quality data without affecting the integrity of the specimen, which makes XPS a valuable tool for both academia and industry. We will discuss the utilization of XPS for the analysis of ligands and organometallic compounds deposited on appropriate supports for the design of mono- and multilayer-based materials, as well as for the synthesis of metal nanoparticles. The applications of these materials are very broad and include detecting and removing heavy metals, developing electrochromic materials and supercapacitors, etc. In addition, we will touch upon the possibility of using XPS in forensic science to analyze the degradation of blood pools. Based on the examples provided, you will see that the insights gained from XPS analysis of metal complexes have the potential to drive innovations in diverse fields, from water quality and sustainable energy technologies to forensic science.