Physical Methods in Inorganic Chemistry

X-ray spectroscopy – R. Mom, Leiden Institute of Chemistry

Whether it is in batteries, enzymes, fuel cells, or LED's, most functional materials contain a range of elements. Using X-ray spectroscopy, we can assess the chemistry of each of these elements individually. This allows one, for example, to follow the oxidation state of metal ions mixed metal oxide electrodes during operation, or to determine the coordination environment of the active metal site in organometallic complexes.
In the lecture, I will discuss two flavors of X-ray spectroscopy: XPS and XAS. I will explain the physical principles behind the two techniques and how they can be used to track chemistry "live". Using examples from my own work and the literature, I will show how this contributes to our understanding of (electro)catalysis.