

L edge RIXS is a direct probe for the electronic excitations in 3d transition metal oxides

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Resonant Inelastic X-ray Scattering (RIXS) can be effectively used to study the low energy electronic excitations in solids. Working at the $L_{2,3}$ absorption edges is ideal in 3d transition metals compounds, because the resonant excitation and de-excitation allow us to measure the energy of excited states unreachable by direct electric dipole transitions. Those excited states (among them the so-called *dd* excitations) extend from a few eV down to the tens of millielectronvolt energy scale. As the $2p$ state binding energies of 3d transition metals are between 400 eV and 1000 eV, they fall in the energetic range of the soft X-rays of beam line ID08.

We present some recent RIXS spectra measured, with unprecedented energy resolution and data quality, across the L_3 edge of CuO, NiO, CoO, MnO . Those results, obtained on prototypical compounds, can be interpreted within a simple crystal field model, opening the way to the use of RIXS for the study of the 3d transition metal ion local coordination in more complicated cases belonging to the rich family of transition metal oxides.