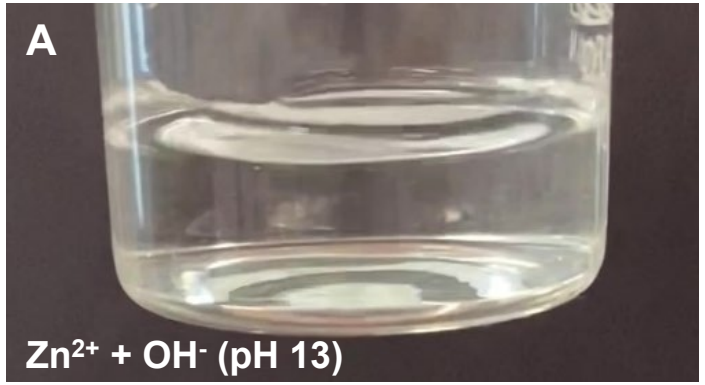
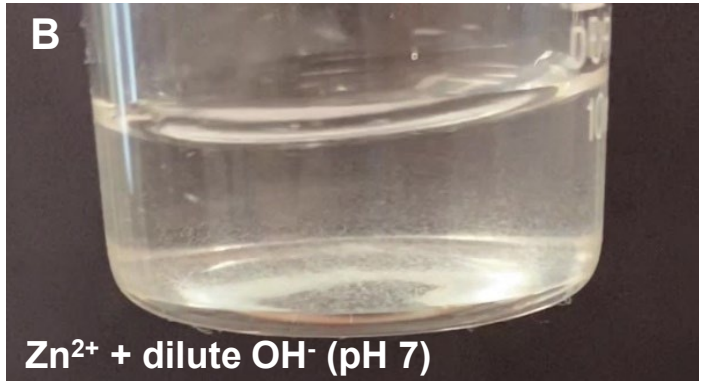
Electronic Supplementary Material (ESI) for Metallomics.

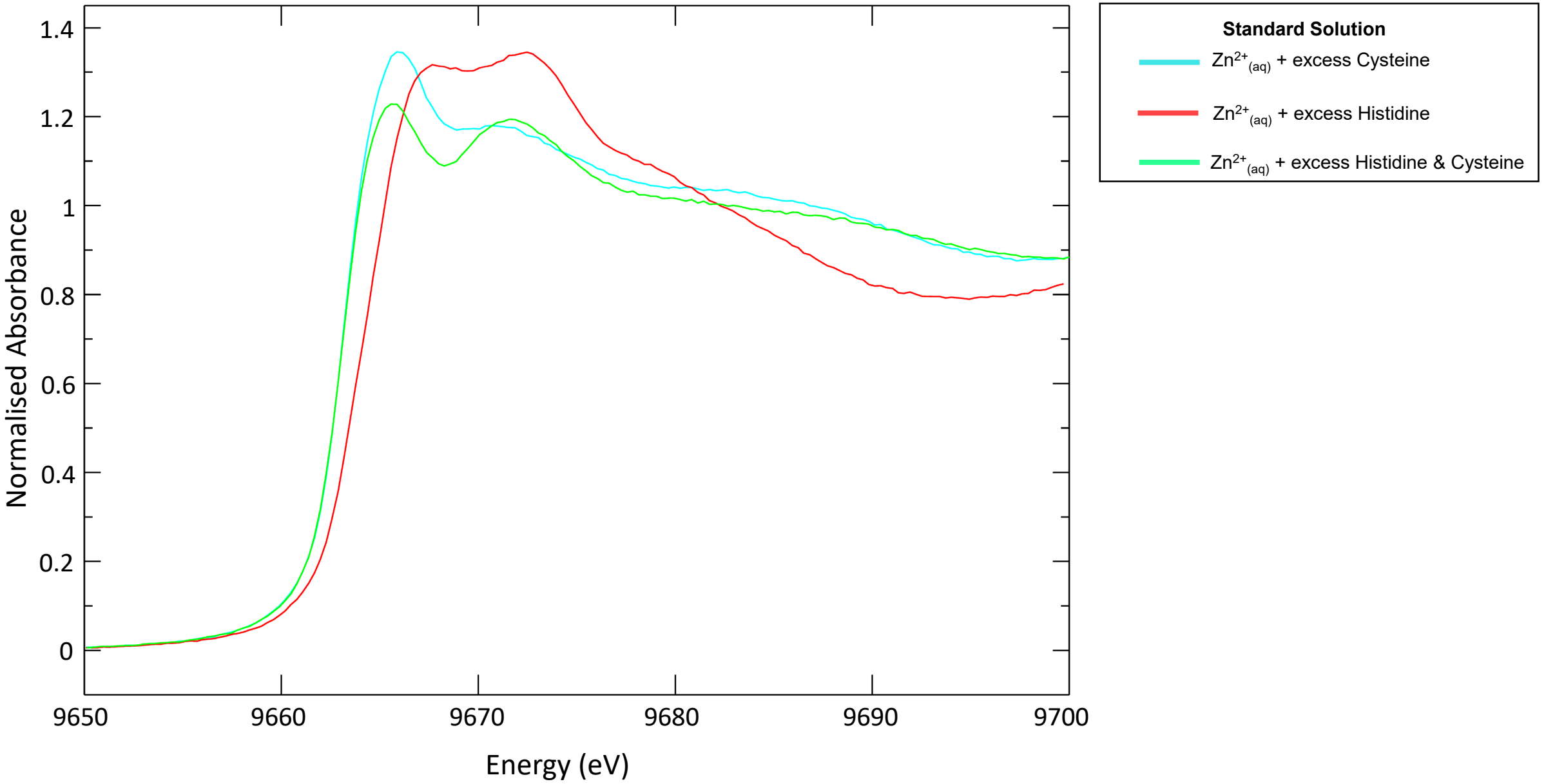




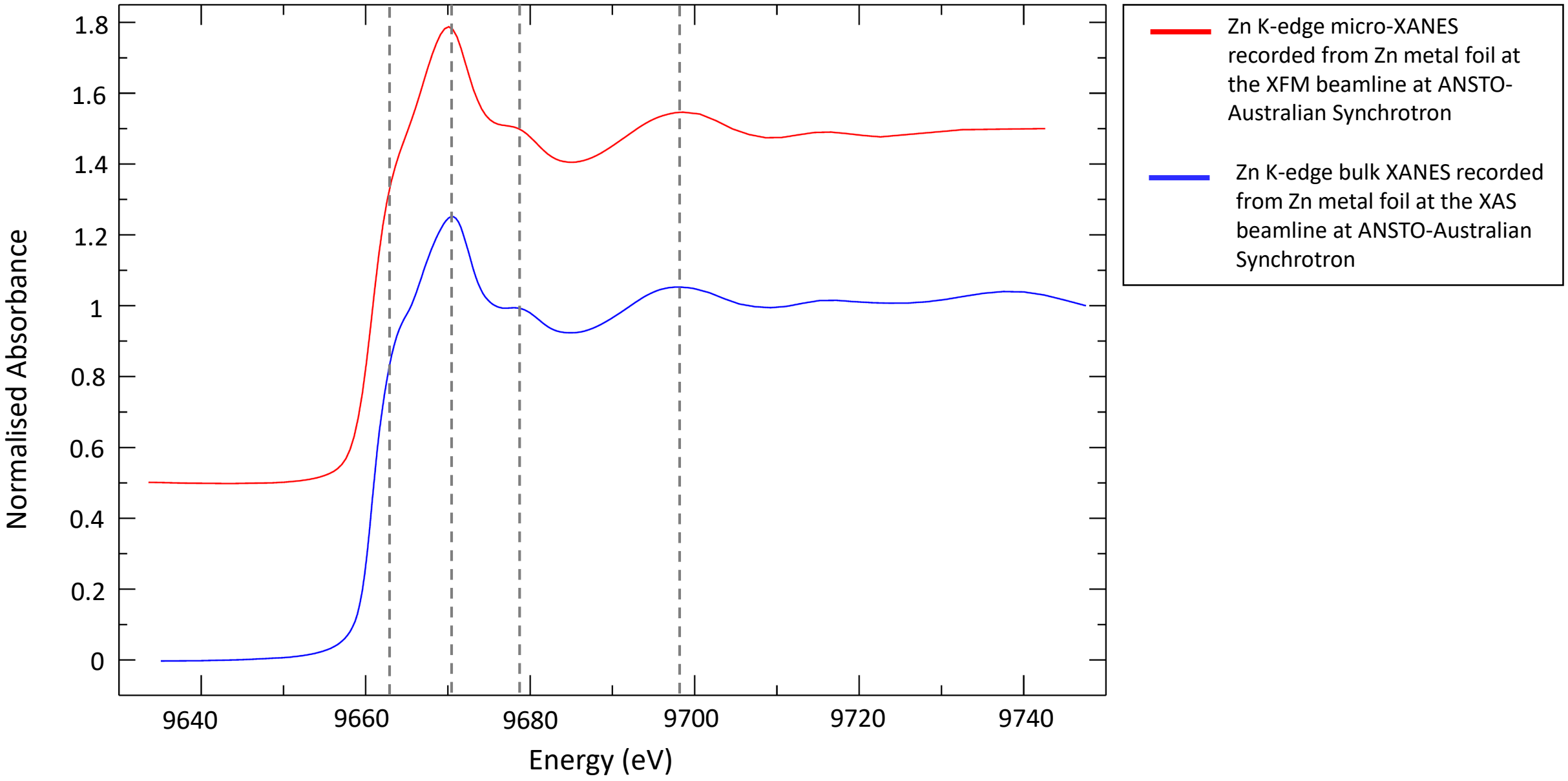
C **Results from Dynamic Light Scattering**

	Derived Count Rate (kcps)	
	Zinc nitrate hexahydrate (1mM)	Zinc nitrate hexahydrate (1mM) + 1 pellet NaOH
Replicate 1	88	40
Replicate 2	75	39
Average	81.5	39.5

Supporting Figure 1: Visible appearance of Zn^{2+} standard solutions after (**A**) the addition of concentration OH^- as undertaken for synchrotron experiment, or (**B**) dilute OH^-. The latter shows the appearance of a white precipitate attributed to $Zn(OH_2)_s$, which is known to have low solubility at pH 7. Dynamic light scattering, DLS (**C**) did not indicate increased presence of particles in standard solution A, relative to the Zn^{2+} (Zinc nitrate hexahydrate solution). DLS measurements recorded on a Malvern Zetasizer Nano ZS.



Supporting Figure 2: Zn K-edge XANES of standard solutions of $Zn^{2+}_{(aq)}$ in the presence of excess histidine, excess cysteine, or a mixture of excess cysteine & histidine.



Supporting Figure 3: Zn K-edge XANES recorded from Zn metal energy calibration foils at the XFM and XAS beamlines at the ANSTO-Australian Synchrotron. Spectra are vertically offset for clarity.