Electronic Supplementary Information

A lab-based micro X-ray fluorescence spectrometer with high photon flux and spatial resolution for ancient ceramic research

Xiaosheng Lin[#1], Miaomiao Wang[#1], Miao Shu[1], Chaoyang Li[3,4], Haijing Li[1], Xu Wang[1,*], Chunzhen Yang[1,2,*], Rui Si[1,*]

Table S1 The comparison of the μXRF setup with commercially devices.

Manufacturer		Our	Bruker	EDAX	Sigray
Product			M4 TORNADO	Orbis PC	AttoMap
Source	Target material	Ga-In (95% / 5%) alloy	Rh (optionally: Mo, Ag, Cu, W)	Rh anode	Multiple targets (SiC, Cr, Cu, Au, Mo, Rh, W)
	Voltage & power	70 kV, 250 W	50 kV, 30W	50 kV, 50 W	20-45 kV, 100W
Excitation	Focusing optics	Multi-layer focusing mirror	polycapillary lens	polycapillary lens	Sigray twin paraboloidal X-ray optics
	Spot size	70 μm (H) × 63 μm (V)	25 μm @ Mo-Kα	30 μm @ Mo-Kα	7-10 μm with standard optics
	Working distance	156 mm	< 10 mm	Several mm	30 mm
Detector	Type	XFlash 6-60 silicon drift detector	XFlash® silicon drift detector	LN-free silicon drift detector	Silicon drift detector
	Active area	60 mm^2	30 mm^2	30 mm^2 / 50 mm^2	30 mm^2
	Energy resolution	< 126 eV @ Mn-Ka	< 145 eV at 300,000 cps	< 145 eV @ Mn-Ka	< 129 eV @ Mn-Ka
Detection limits (Z: 22-29)		34.1-5.7 ppm	100-25 ppm (Ref[1])	40-25 ppm (Ref[2])	Unknown

References:

[1] https://www.bruker.com/en/products-and-solutions/elemental-analyzers/micro-xrf-spectrometers/m4-tornado/_jcr_content/root/sections/more_information/sectionpar/linklist_128117339/contentpar-2/calltoaction_1068631.download-asset.pdf/links/item6/Micro-XRF-Application-Note-XRF-442-Analytical-performance-of-M4-TORNADO.pdf.

[2] https://www.edax.com.cn/-/media/ametekedax/files/micro_xrf/technical_notes/advantages-of-xray-over-electron-excitation-in-microanalysis.pdf?dmc=1&la=zh-cn&revision=0641dafe-d853-4532-92a7-bc8638c39fe8.