separations

MDPI

Supplementary materials

High-purity corundum as support for affinity extractions from complex samples

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DLS measurements of corundum powder F1200

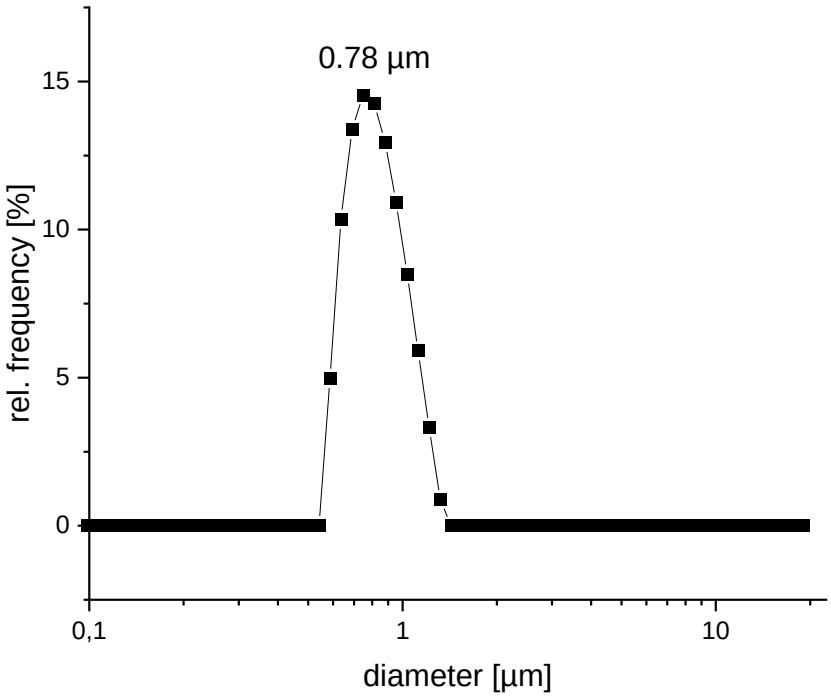

Figure S1. Dynamic light scattering (DLS) measurements of corundum F1200 in 0.1 M PBS indicated an average particle size of 0.78 µm.

Purification of corundum

A scanning transmission electron microscope measurement combined with an energy-dispersive X-ray spectroscopy (EDX) analysis revealed that impurities of sodium and chlorine-containing needle-shaped crystal structures were detected covering the corundum surface (Figure S2). A purification protocol was established to eliminate these impurities and form a clean corundum surface (Figure S3). BET- measurements, before the purification protocol was performed, indicated a corundum surface of 5.2 m^2/g, whereas, after the purification, the surface decreased to 4.5 m^2/g (Figure S4). This decrease in surface area was to be expected since the needle-shaped structures had been removed completely.

TEM images of unpurified and purified corundum

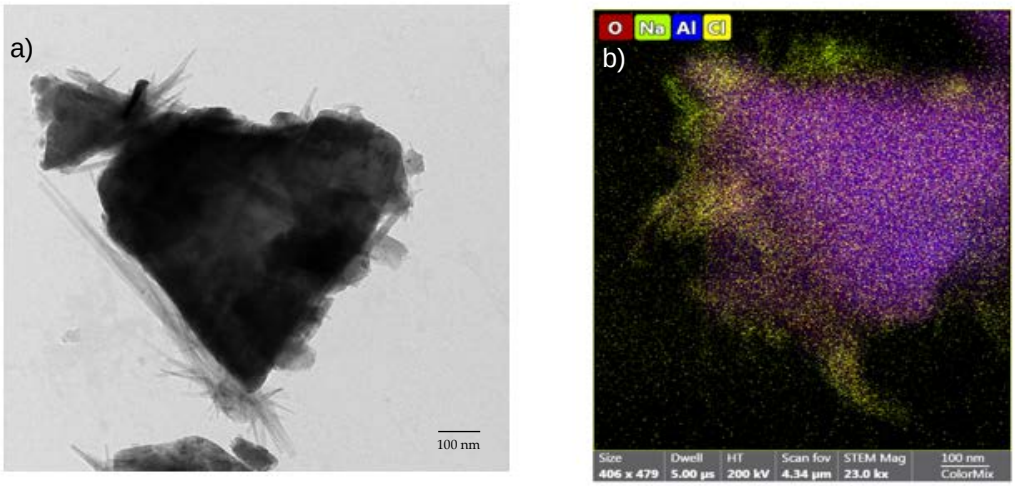

Figure S2. TEM micrograph of unpurified corundum. Corundum surface covered with needle-shaped crystals a). Elemental mapping showing sodium- and chloride-containing structures b).

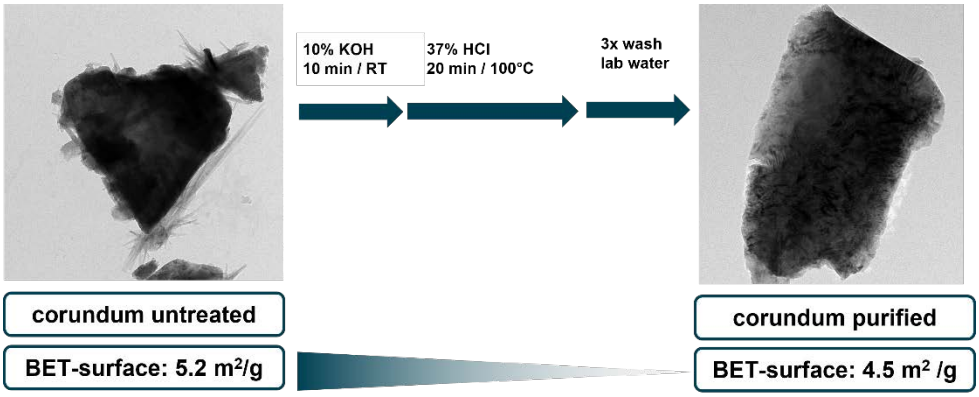

Figure S3. Purification protocol for corundum powder.

BET plots

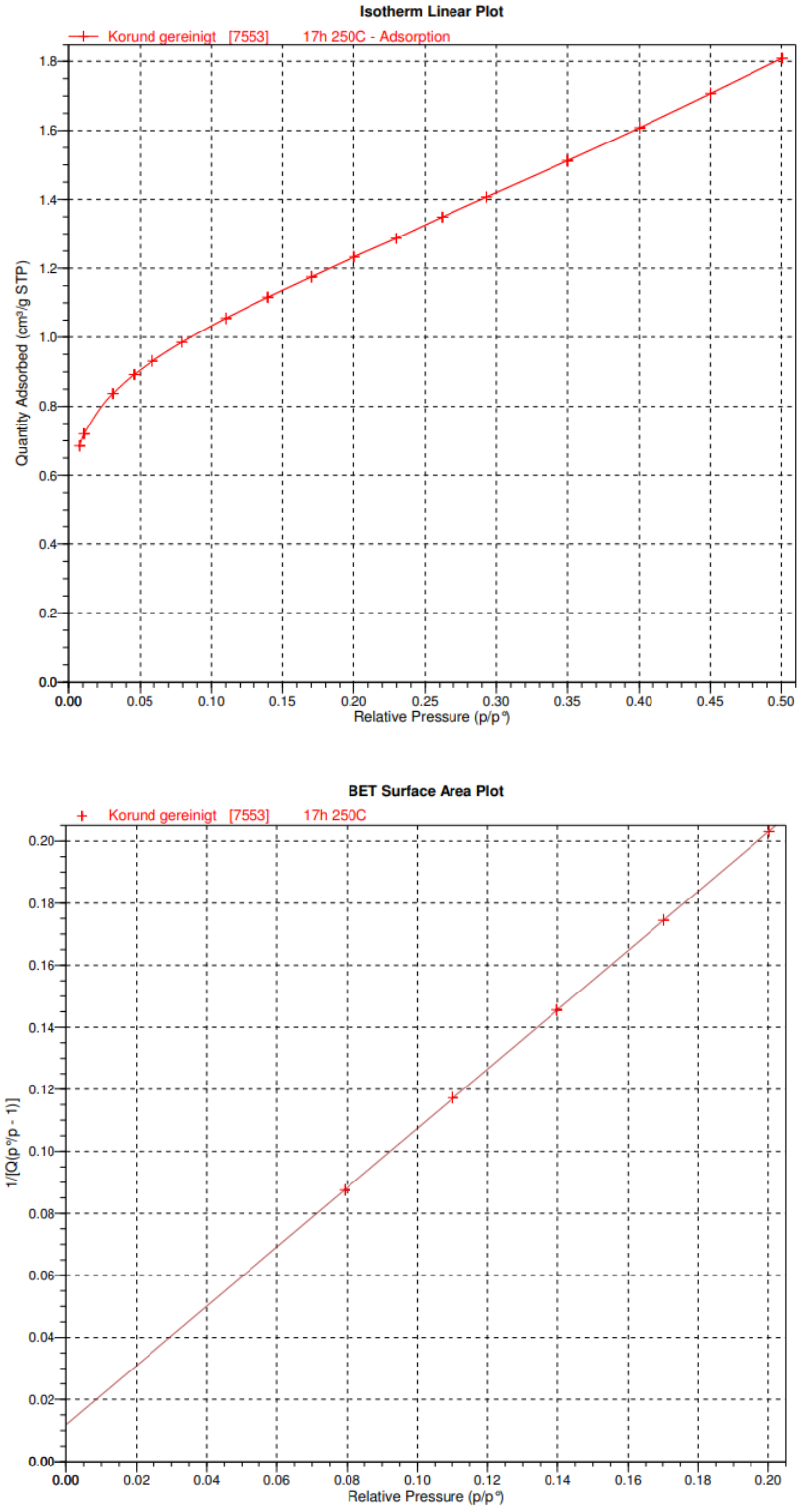

Figure S4. BET measurements. Isotherm linear plot and BET surface area plot.

HPLC - Calibration of tyrosine

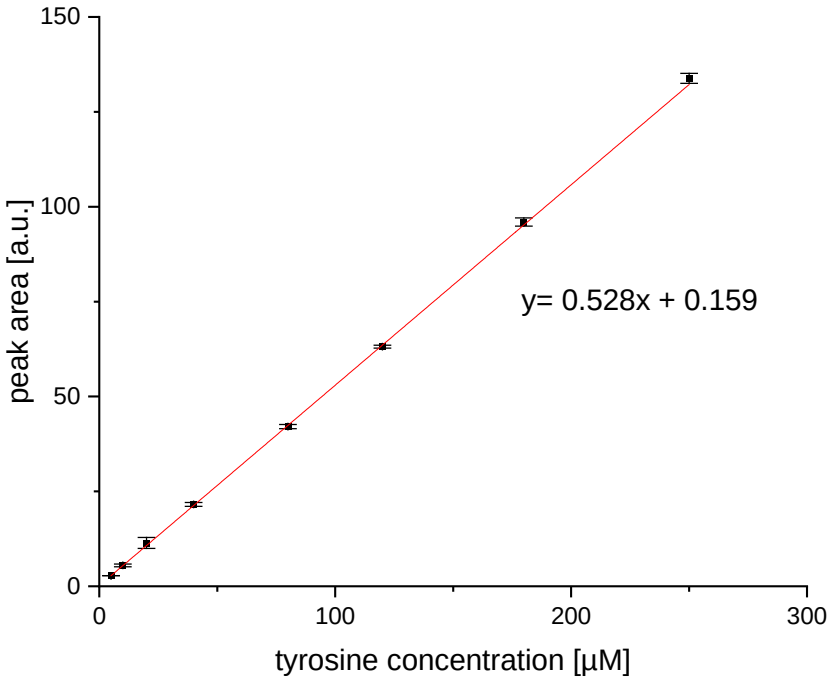

Figure S5. Calibration line of tyrosine (amino acid standard solution). Fluorescence detection was performed at 272 nm (Ex.) and 303 nm (Em.).