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Electrospray deposition followed by laser-induced breakdown spectroscopy (ESD-LIBS): a new method for trace elemental analysis in aqueous samples

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Electronic supplementary information (ESI)

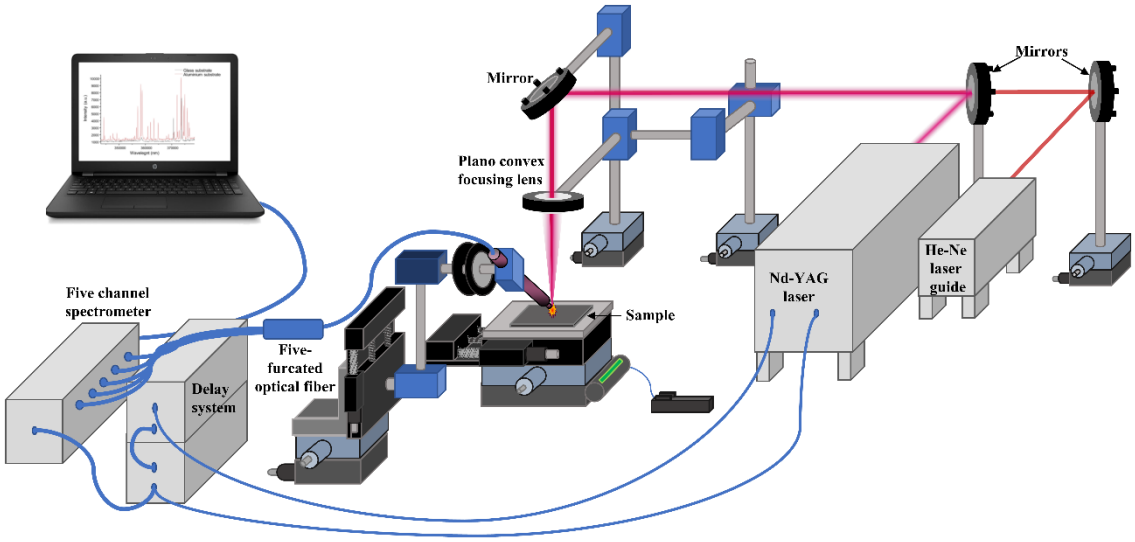

Figure S1. Scheme of the LIBS experimental setup

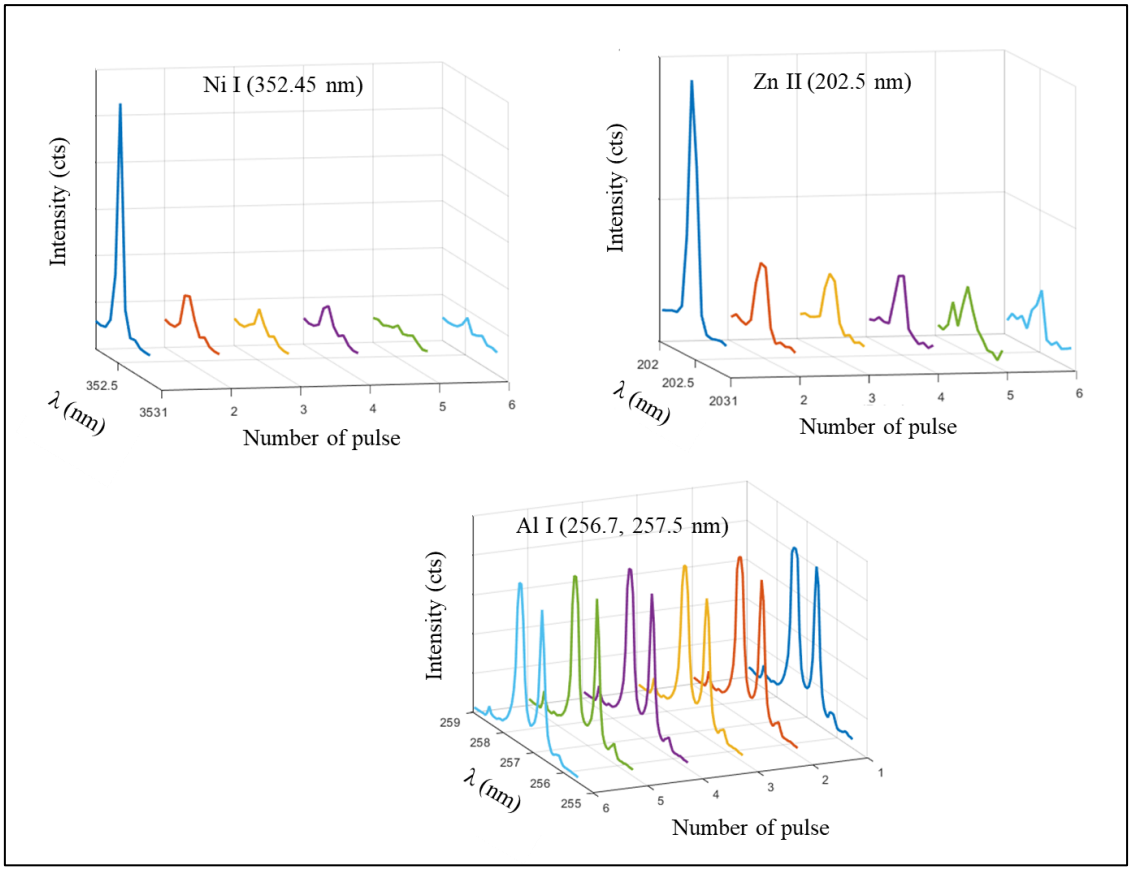

Figure S2. Emission intensity obtained for Ni, Zn and Al emission lines in the depth profiling analysis of a solid residue generated By ESD of a 0.5 mg kg^{-1} concentration standard solution on an aluminium foil.

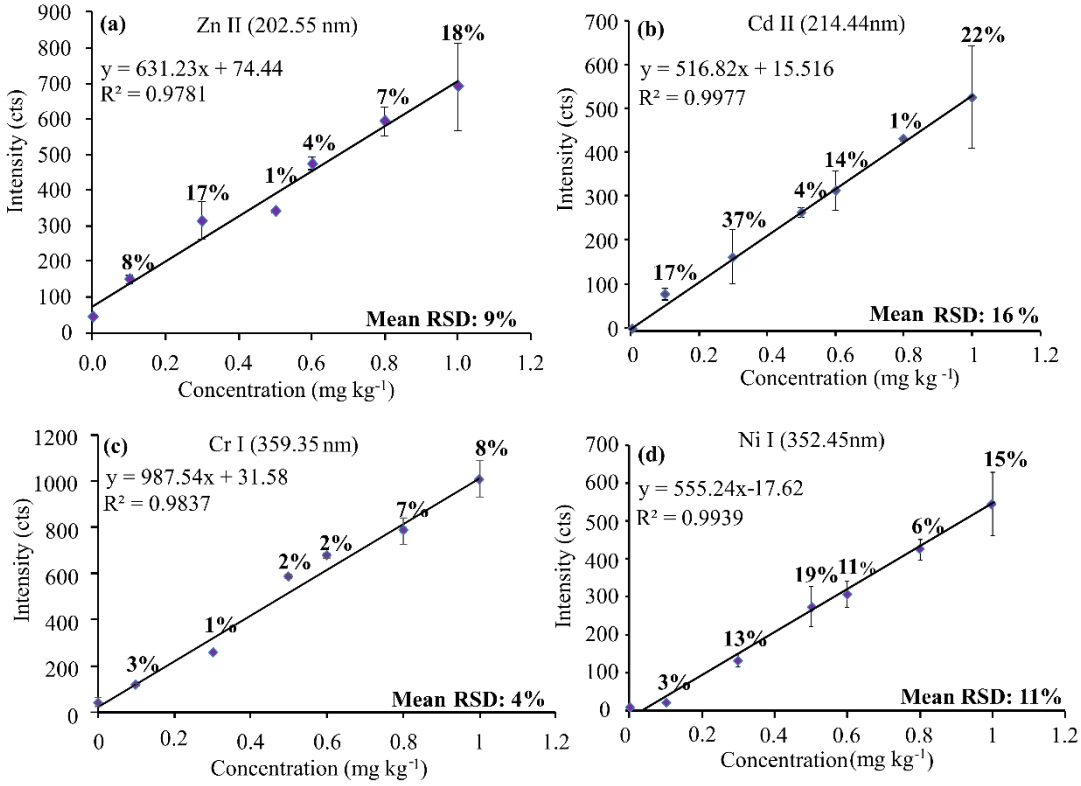

Figure S3. Calibration graphs obtained by ESD-LIBS with the use of the external calibration approach: (a) Zn II (202.55 nm), (b) Cd II (214.44 nm), (c) Cr I (359.35 nm) and (d) Ni I (352.45 nm). Error bars correspond to ± one standard deviation (n=3). The corresponding % RSD values are also indicated in the vicinity of each data point.

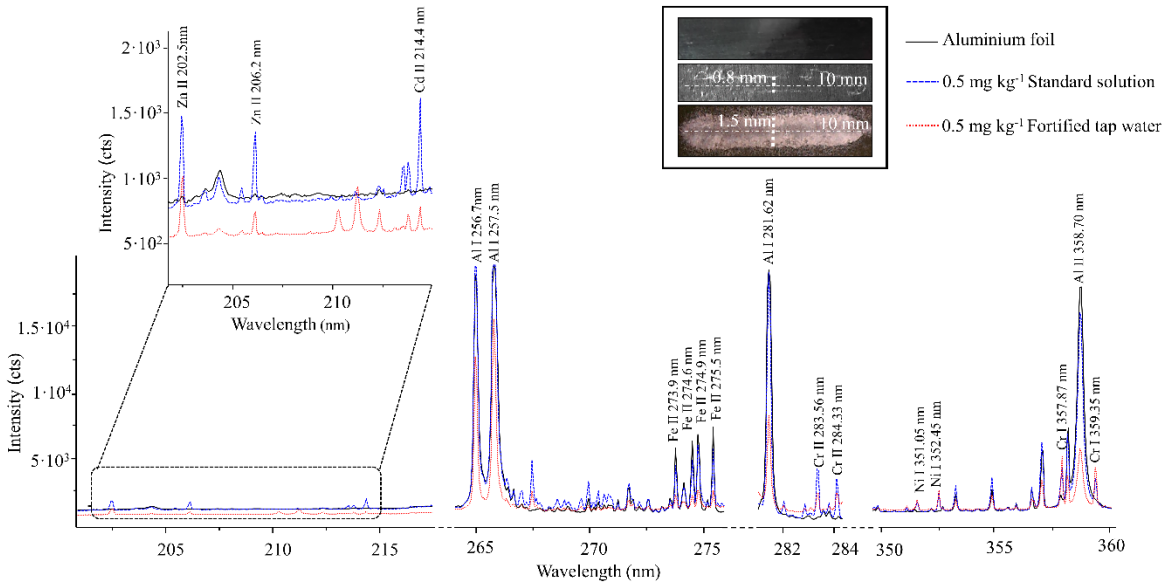

Figure S4. Analysis of: (black solid line) a blank (i.e., without solid residue) aluminium foil, (blue dashed line) a 0.5 mg kg^{-1} concentration standard solution residue on the aluminium foil and (red dotted line) a 0.5 mg kg^{-1} fortified tap water residue on the aluminium foil. Upper right inset: Photographs of the analysed aluminium foil, solid film obtained by ESD of the 0.5 mg kg^{-1} standard solution and solid film obtained by ESD of the 0.5 mg kg^{-1} fortified tap water sample.

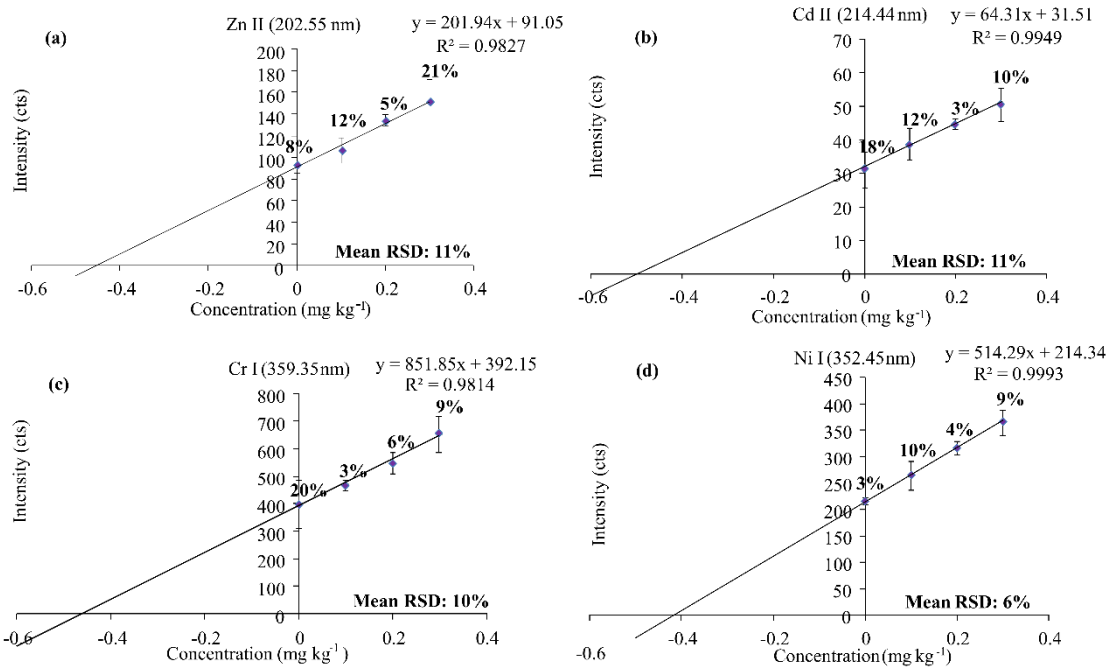

Figure S5. Mean of the three independent calibration graphs obtained by ESD-LIBS with the use of the conventional standard addition calibration approach: (a) Zn II (202.55 nm), (b) Cd II (214.44 nm), (c) Cr I (359.35 nm) and (d) Ni I (352.45 nm). Error bars correspond to ± one standard deviation (n=3). The corresponding % RSD values are also indicated in the vicinity of each data point.

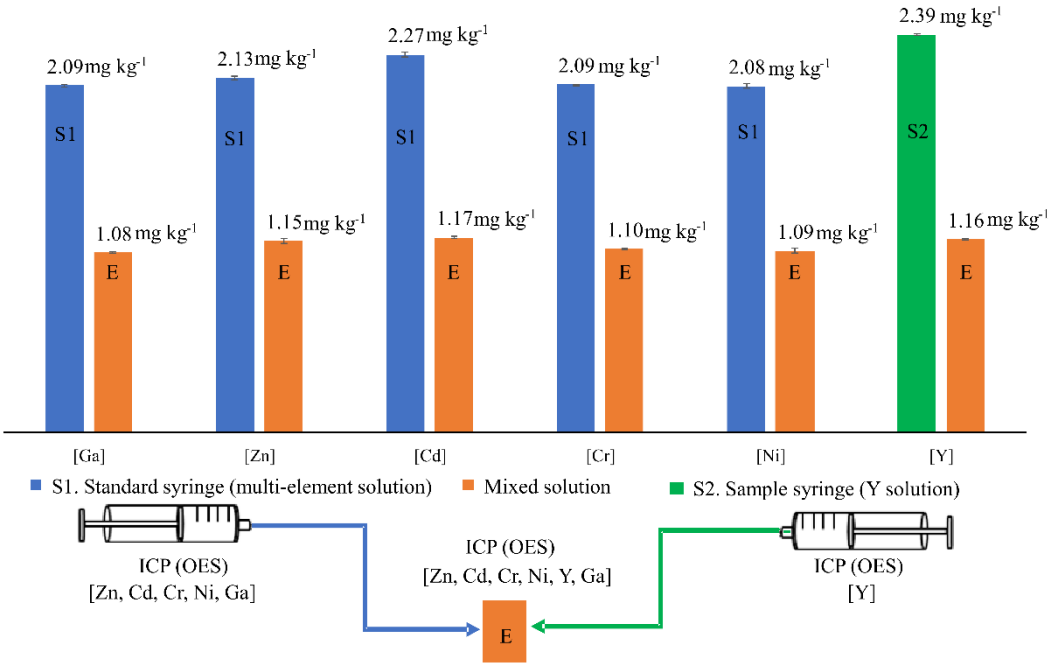

Figure S6. Results obtained in the calibration of the liquid feeding to the ESD system for on-line standard addition calibration procedure

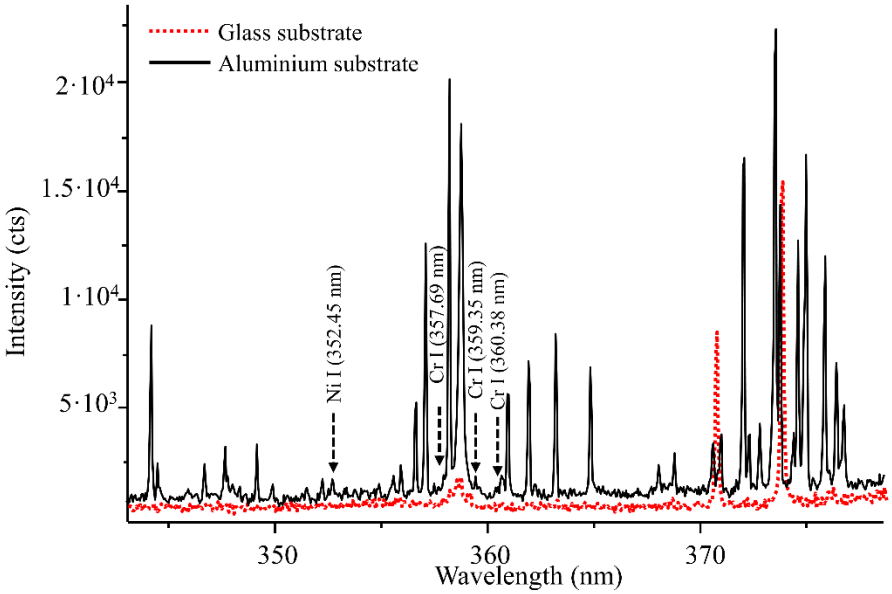

Figure S7. Emission spectra obtained from LIBS analysis of: (black solid line) an aluminum foil and (red dotted line) a glass slide. Arrows in the figure indicate the position of some Ni and Cr emission lines.

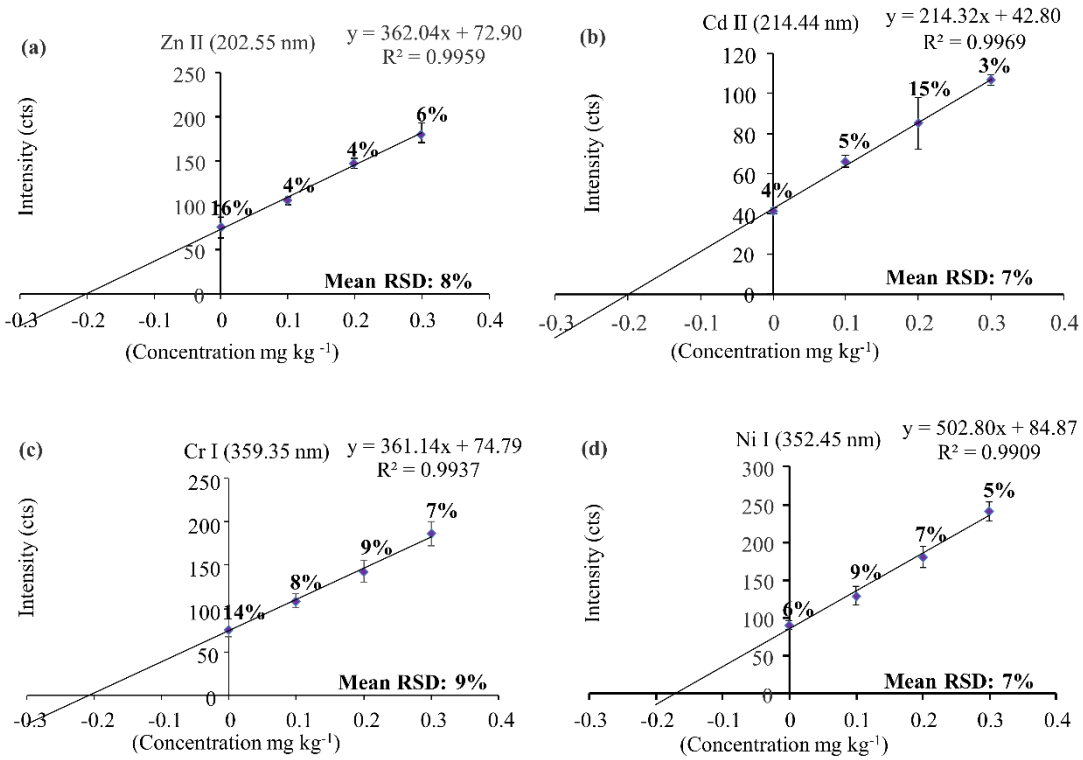

Figure S8. Mean of the three independent calibration graphs obtained by ESD-LIBS with the use of the on-line standard addition calibration approach: (a) Zn II (202.55 nm), (b) Cd II (214.44 nm), (c) Cr I (359.35 nm) and (d) Ni I (352.45 nm). Error bars correspond to ± one standard deviation (n=3). The corresponding % RSD values are also indicated in the vicinity of each data point.