

### **Supporting Information**

Table S1: The test results for raw wastewater composition. Sample 1 of raw wastewater was used for the pristine NPs. Sample 2 of raw waste water was used for the solutions from day-to-day wear of laboratory-prepared socks and pristine NPs.

Test	Units	Sample 1	Sample 2
Chemical Oxygen Demand, COD	mg/L	434	495
Total Nitrogen, N	mg/L N	47	51
Total Phosphorus, P	mg/L PO <sub>4</sub> <sup>3-</sup>	28	42
Total Sulfate, S	mg/L SO <sub>4</sub> <sup>-</sup>	60	87
Ammonia, NH <sub>3</sub> -N	mg/L NH <sub>3</sub> -N	30.9	33
Nitrate, NO <sub>3</sub> -N	mg/L NO <sub>3</sub> <sup>-</sup> -N	0.9	1*
Turbidity	NTU	35	84
Absorbance @254nm	-	1.0489	1.5692
Total Solids	mg/L	1655.6	1072.5
Total Volatile Solids	mg/L	1189	392

\*Test performed the following day

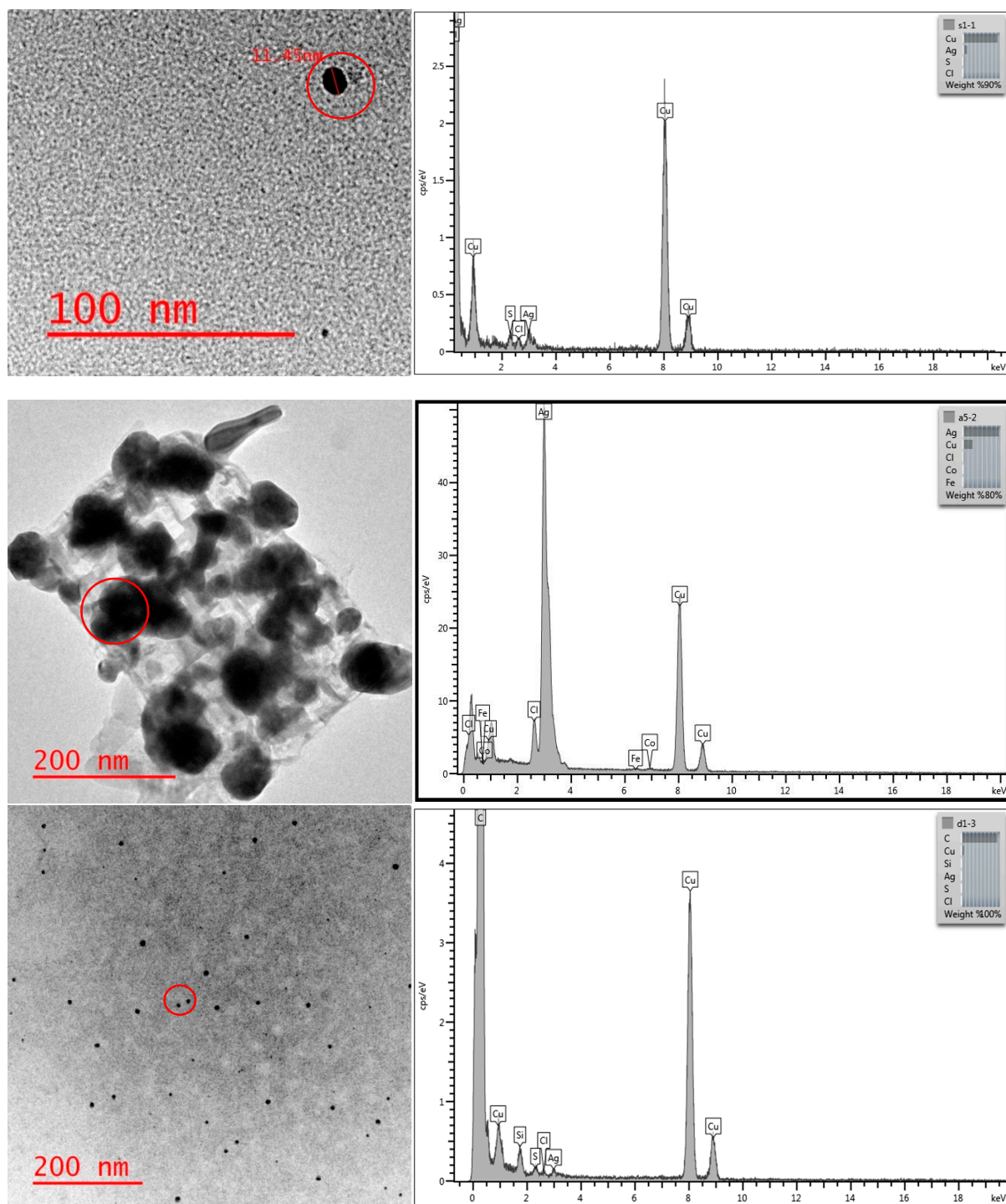


Figure S1: TEM image and EDS data of extracted samples from laboratory-prepared socks exposed to a) sweat b) bleach, c) detergent. Circles indicate areas probed for EDS.

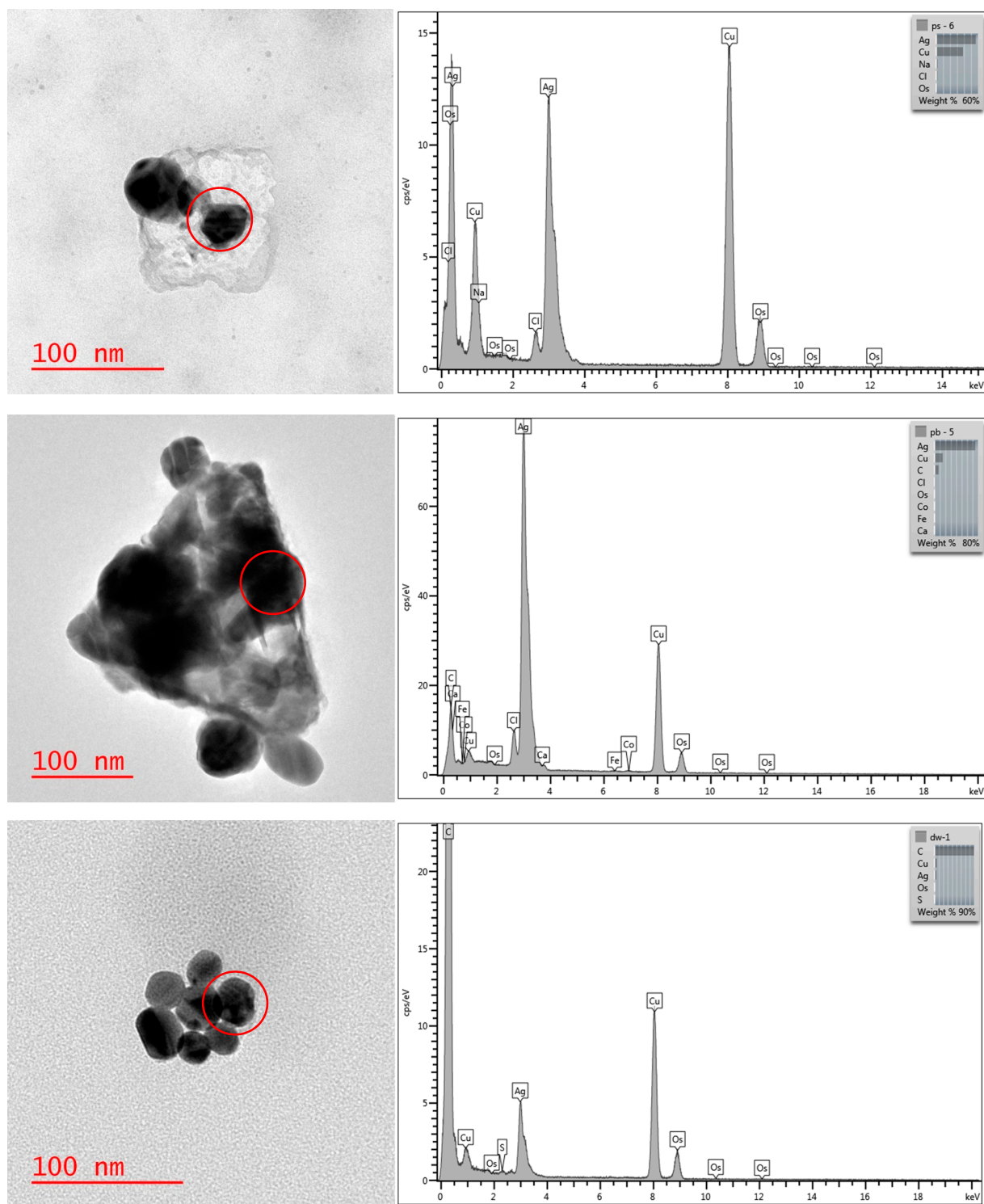


Figure S2: TEM image and EDS data of pristine NPs weathered with a) sweat b) bleach and c) detergent. Circles indicate areas probed for EDS.

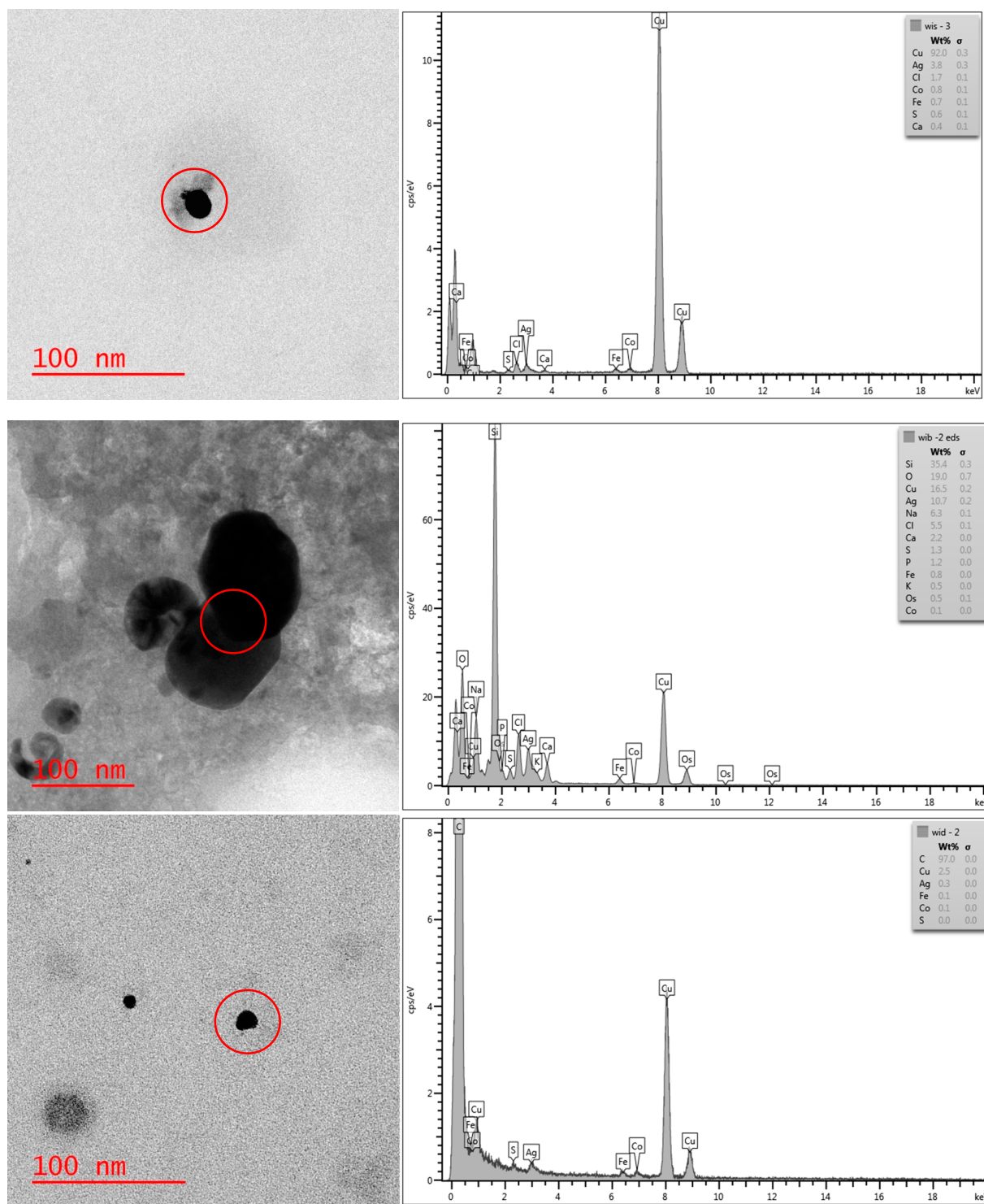


Figure S3: TEM image and EDS data of extracted samples from a) sweat b) bleach c) detergent solutions after treatment with wastewater. Circles indicate areas probed for EDS.



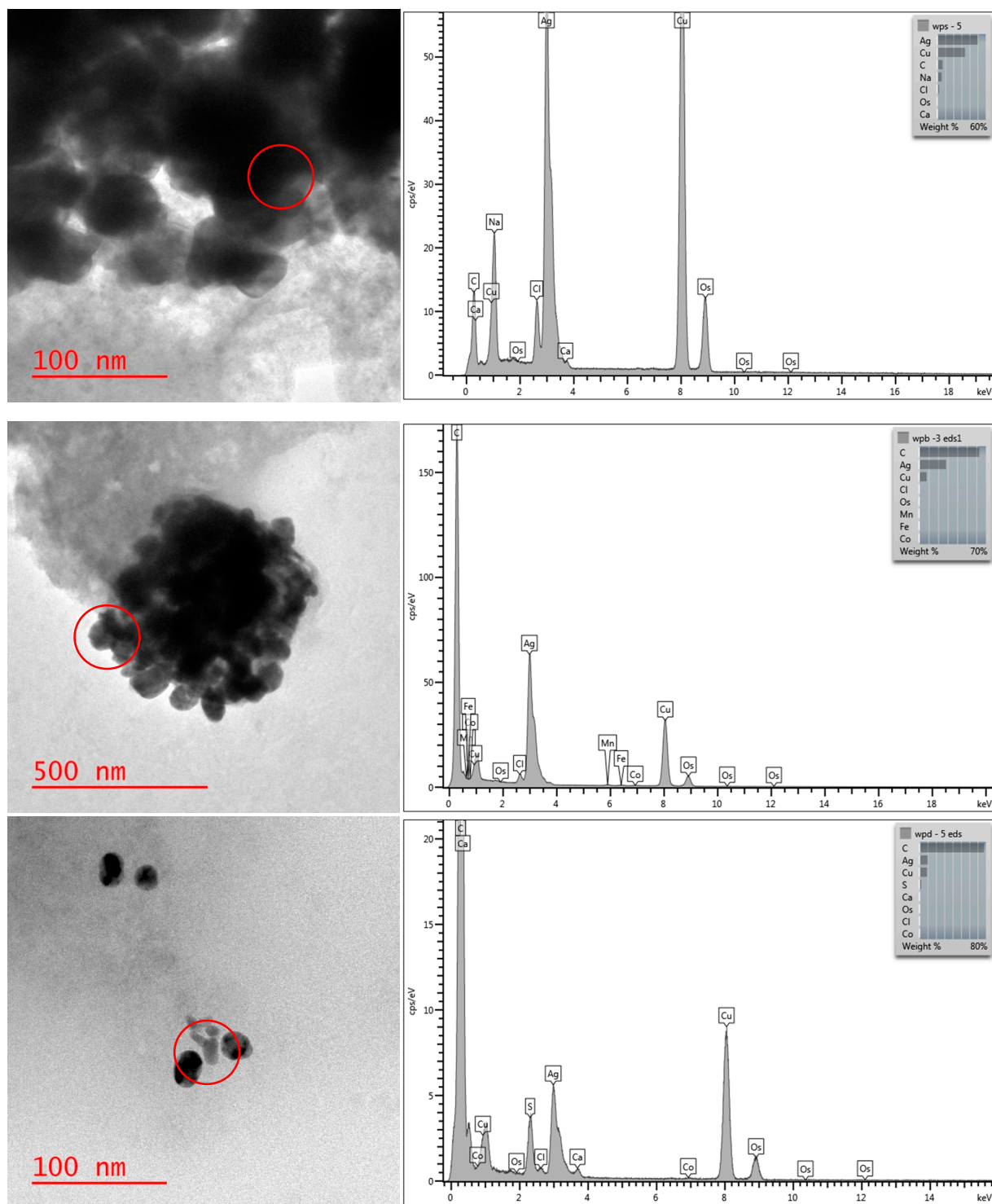
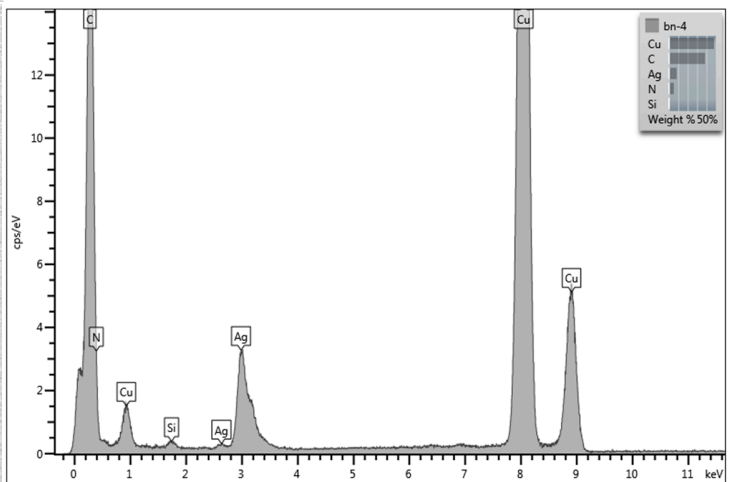
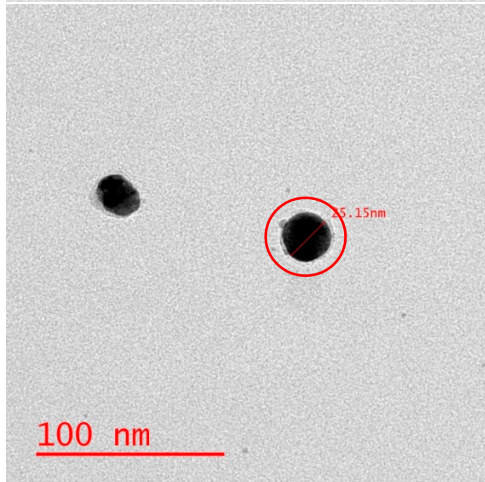
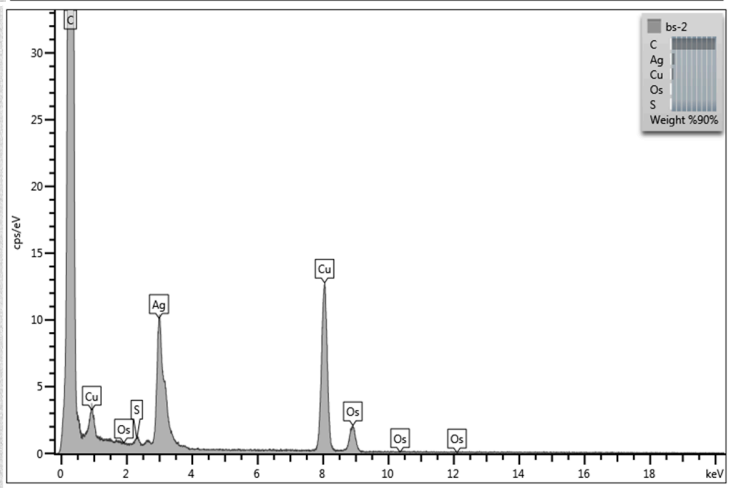
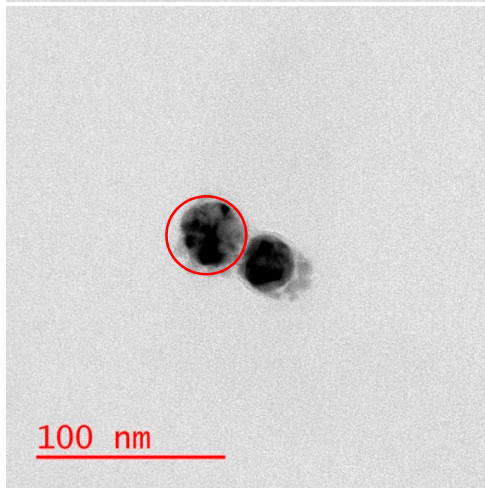
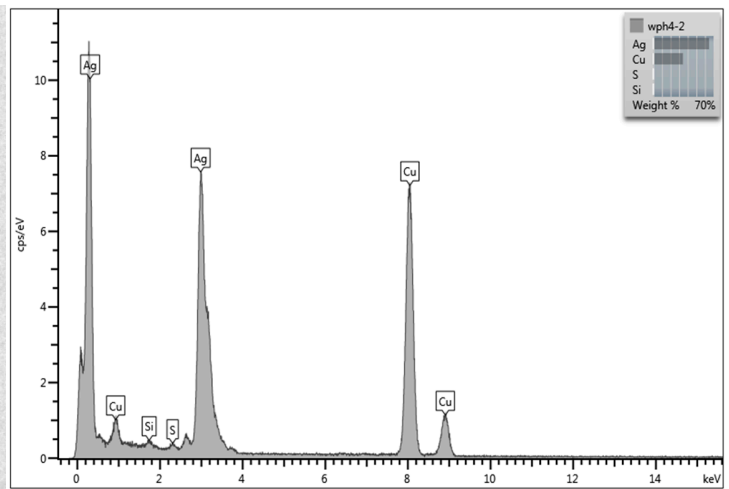
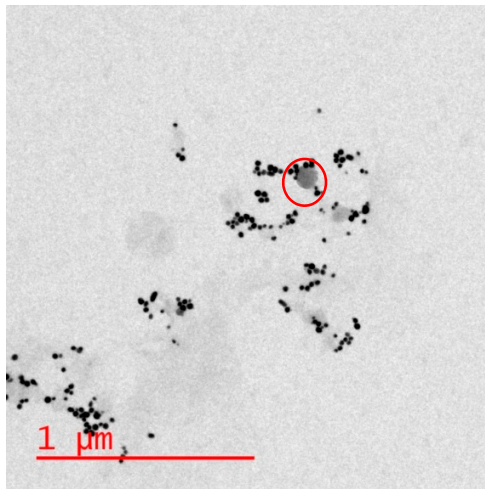


Figure S4: TEM image and EDS data of pristine NPs treated with wastewater after weathering with a) sweat b) bleach c) detergent. Circles indicate areas probed for EDS.



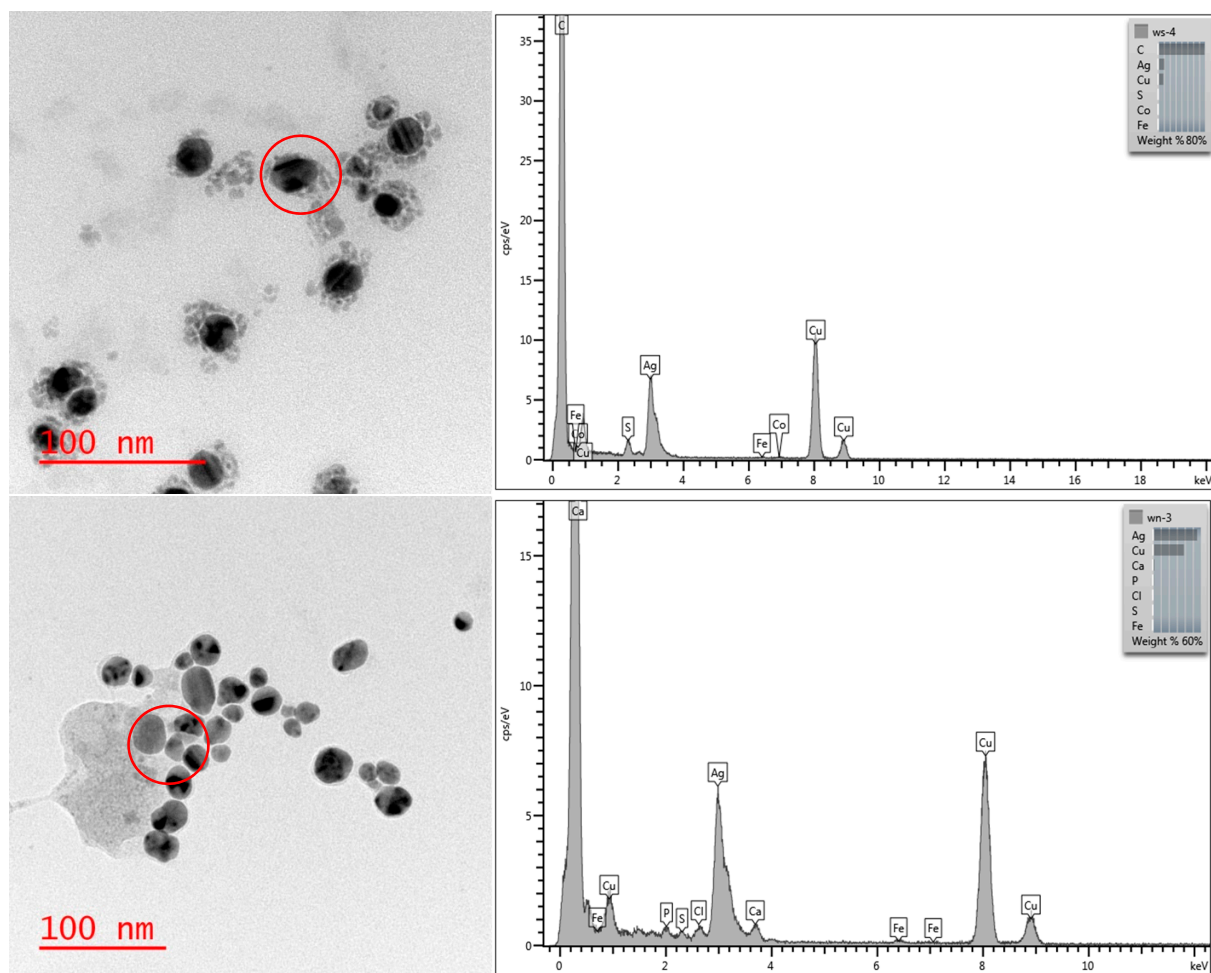


Figure S5: TEM image and EDS data of pristine AgNPs in a) wastewater b) sulfur-rich solution c) nitrogen-rich solution d) wastewater + sulfur-rich solution e) wastewater + nitrogen-rich solution. Circles indicate areas probed for EDS.

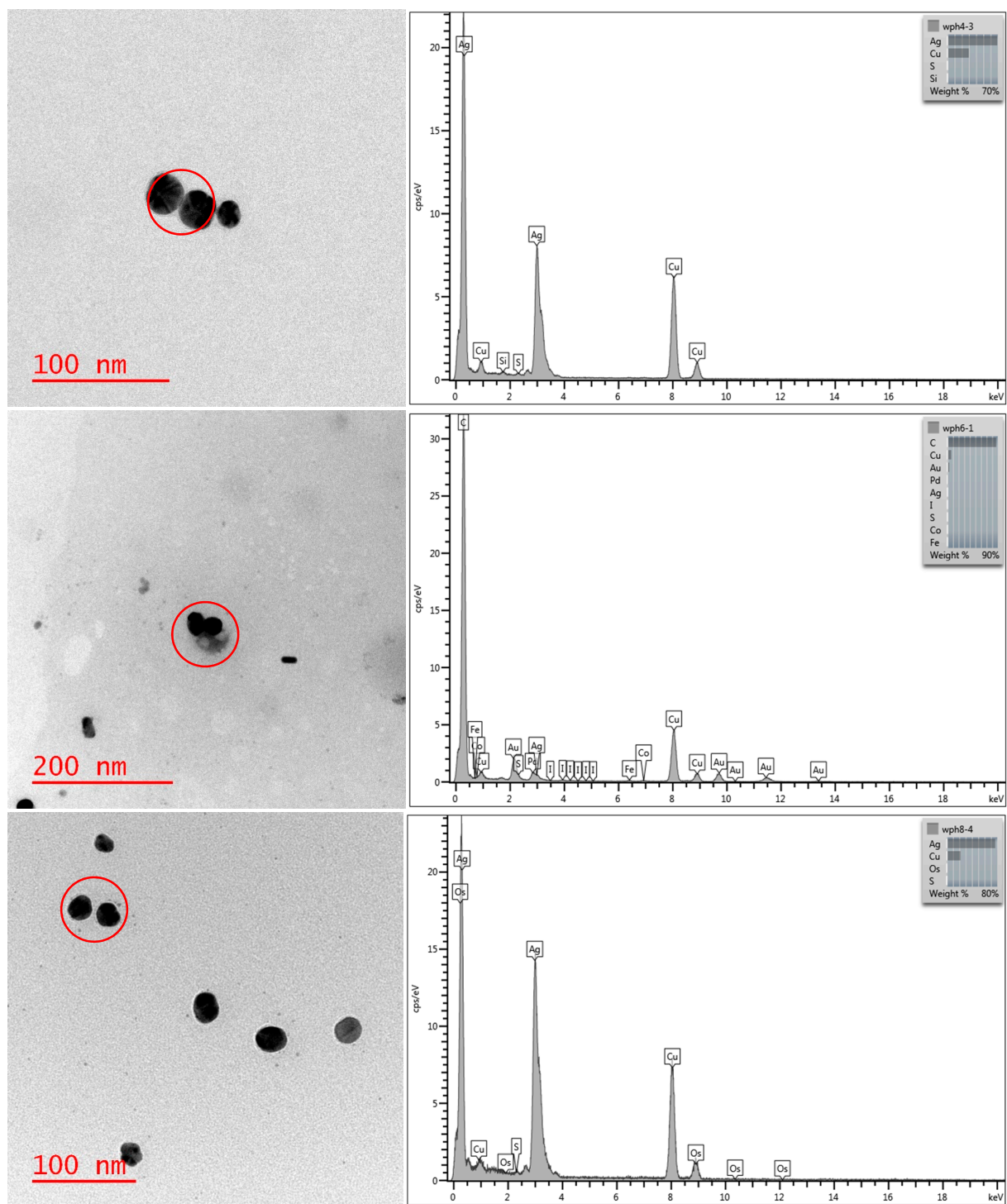


Figure S6: TEM image and EDS data of pristine AgNPs in wastewater with pH altered to a) pH 4.0 b) pH 6.0 c) pH 8.0. Circles indicate areas probed for EDS.