

Supporting Information

Response of aerobic granular sludge to the long-term presence of CuO NPs in A/O/A SBRs: nitrogen and phosphorus removal, enzymatic activity and the microbial community

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TABLES

Tab. S1. Relative distribution of bacterial genus (nitrogen and phosphorus removal related bacteria) for the four AGS samples at the end of the exposure. R1, R2, R3, and R4 represent the control test, 5mg/L CuO NPs, 20mg/L CuO NPs and 50mg/L CuO NPs, respectively.

Bacteria	R1	R2	R3	R4
Flavobacterium	0.27	0.62	0.82	0.94
Thermomonas	0.73	1.68	2.84	3.78
Nitrosomonas	0.11	0.09	0.17	0.61
Nitrospira	2.22	2.87	7.11	8.80
Gemmata	0.2	0.13	0.39	0.37
Acinetobacter	0.46	0.38	0.15	0.08
Pseudomonas	0.08	0.08	0.05	0.02
Dechloromonas	4.93	6.00	2.05	1.02

FIGURES

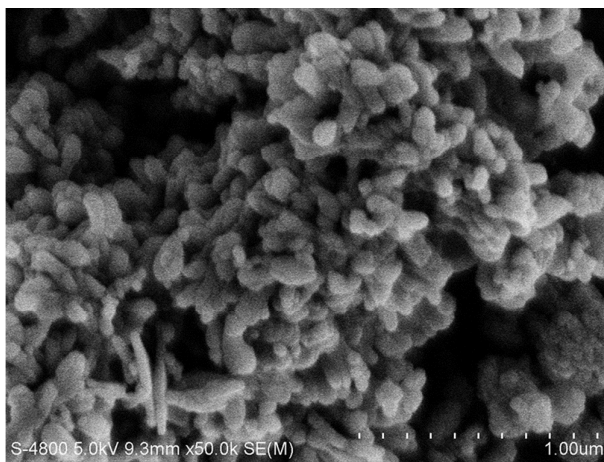


Fig. S1. SEM images of the CuO NPs.

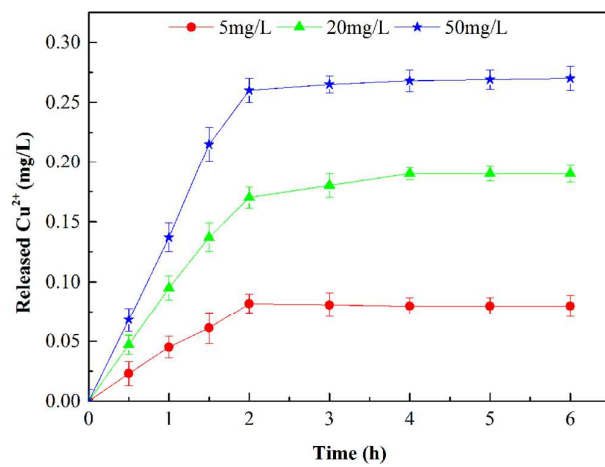


Fig. S2. The kinetics of CuO NPs dissolution.

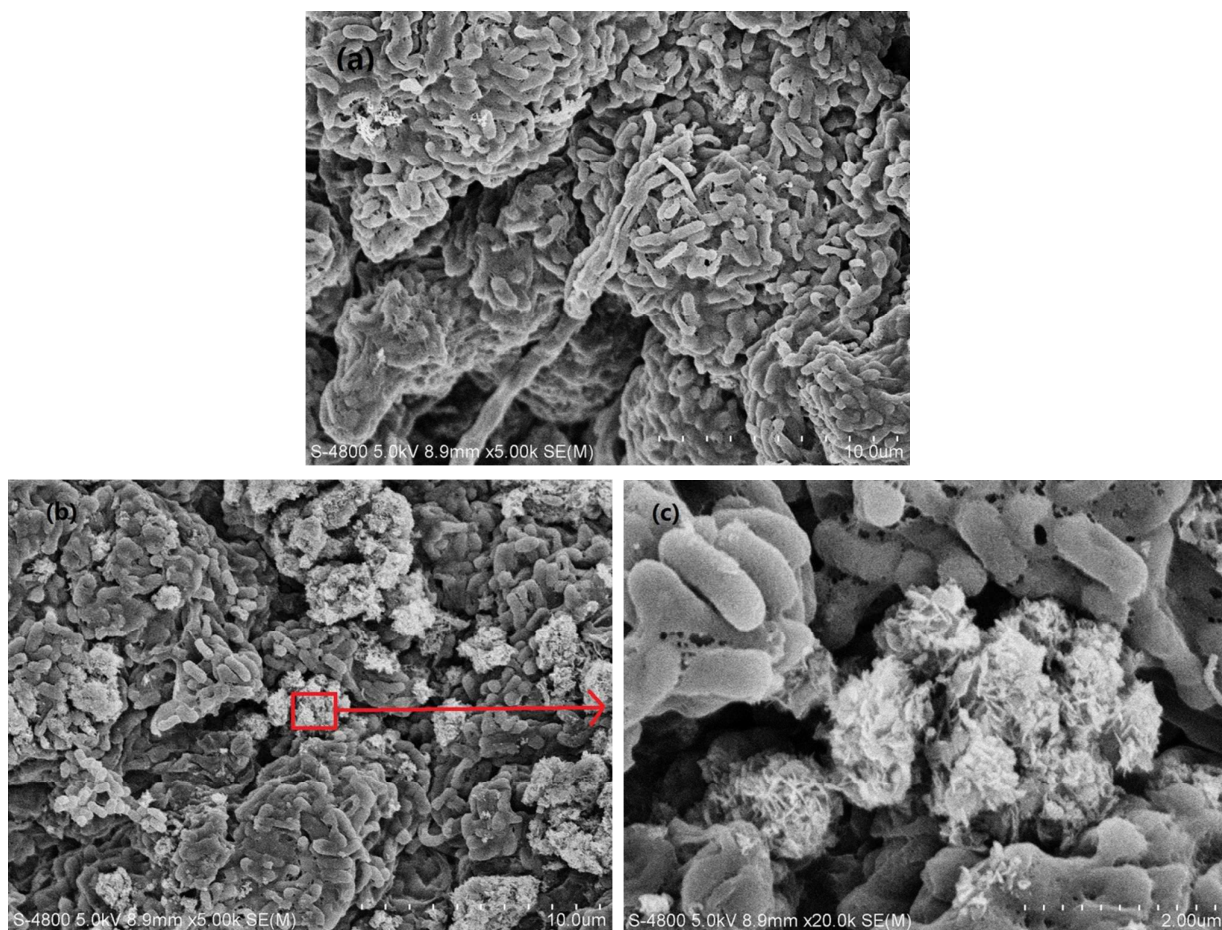


Fig. S3. SEM images of the sludge samples after exposure to 0 mg/L (a) and 50 mg/L (b, c) of CuO NPs concentrations.

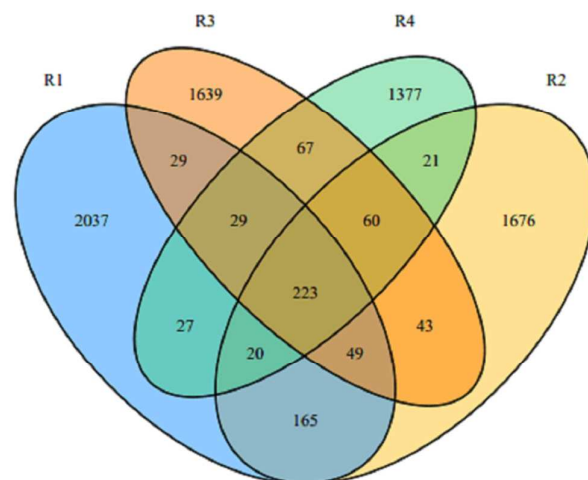


Fig. S4. Venn diagram of OTUs in R1(control), R2 (5mg/L CuO NPs), R3 (20mg/L CuO NPs) and R4 (50mg/L CuO NPs) samples.