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Supplementary material

Long-term performance evaluation of an anoxic sulfur oxidizing moving bed biofilm reactor

under nitrate limited conditions

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Day	Experiment	Volume (mL)	No. of carriers used (pieces)	Initial concentrations		N/S ratio	VSS	Removed	Produced	Specific uptake rate ^a	
				S ₂ O ₃ ²⁻ -S (mg L ⁻¹)	NO ₃ ⁻ -N (mg L ⁻¹)	(mol/mol)	concentration (mg L ⁻¹)	S ₂ O ₃ ²⁻ -S (mg L ⁻¹)	SO ₄ ²⁻ -S (mg L ⁻¹)	STUR (g S ₂ O ₃ ²⁻ -S g VSS d ⁻¹)	SNUR (g NO3 ⁻ -N g VSS d ⁻¹)
107	Effect of different biofilm characteristics - thick-dark brown biofilm	40	5	200	100	0.5	265 (± 20)	190 (± 4)	259 (± 10)	1.91 (± 0.04)	0.89 (± 0.02)
	- thin-light brown biofilm						175 (± 20)	189 (± 1)	271 (± 16)	1.69 (± 0.22)	0.88 (± 0.21)
306	Effect of sequential feeding 4	40		200	100	0.5					
	- carrier-attached biomass		5				260 (± 20)	125 (± 14) to 290 (±73)	178 (± 16) to 352 (± 85)	4.08 (± 0.19), 5.80 (± 1.40) and 4.09 (± 0.72)	0.84 (± 0.05), 1.81 (± 0.68) and 0.84 (± 0.13)
	- suspended biomass		32 mL				160 (± 60)	168 (± 9) to 268 (± 11)	173 (± 77) to 398 (± 38)	1.13 (± 0.07), 2.59 (± 0.21) and 4.91 (± 0.86)	0.28 (± 0.04), 0.69 (± 0.05) and 1.10 (± 0.08)

Table S1. Experimental conditions of the batch activity tests performed with the MBBR biomass collected at different operational days.

^a STUR = specific thiosulfate uptake rate; SNUR = specific nitrate uptake rate

^b The three values reported for the removed $S_2O_3^{2-}S$, produced $SO_4^{2-}S$, STUR and SNUR were calculated before the first feeding, after the first feeding and after the second feeding, respectively



Fig. S1. Residence time distribution (RTD) curve of the MBBR at a HRT of 5 h performed on day 307.