



Supplementary Material

Table S1. Substrate conversion, and methane production, after 29 h of biological anaerobic assays, in blank controls without dye, controls without CNM, and assays in the presence of 0.1 g L⁻¹ of CNM.

Sample	Acetic acid (mmol L ⁻¹)		Propionic acid (mmol L ⁻¹)		Butyric acid (mmol L ⁻¹)		CH ₄ (mmol L ⁻¹)
	0	29	0	29	0	29	29
Blank	2 ± 0.1	0	10.4 ± 0.6	0.7 ± 0.9	7.2 ± 0.8	6.9 ± 0.2	13.1 ± 0.01
Control	2.2 ± 0.1	0	9.8 ± 0.8	0	6.6 ± 0.4	5.6 ± 0.1	13.3 ± 0.01
CNT	2.3 ± 0.6	0	11.3 ± 1.1	0	7.7 ± 0.6	6.9 ± 0.5	11.9 ± 0.3
CNT_MB	2.7 ± 0.2	0	10.1 ± 0.5	0	6.8 ± 2.4	4.5 ± 0.8	12.4 ± 0.3
CNT_HNO ₃	2.3 ± 0.04	0	10.6 ± 0.5	0	7.7 ± 0.1	5.5 ± 0.6	11.8 ± 0.4
CNT@2%Fe	3.6	0	11.7	0	8.3	5.9	13.1 ± 0.01
CNT@2%Fe_N_MB	3.7	0	11.7	0	8.3	7.3	12.7 ± 0.4
CNT@2%Fe_N_HNO ₃	2.4 ± 0.1	0	10.6 ± 0.9	0	7.5 ± 0.1	5.7 ± 0.4	10.5 ± 0.5

Table S2. Formation rate (a.u./day) and quantity (%) of each of the detected by-products of the biological reduction of AO10, after 48 h of anaerobic process, in the absence (control) and presence of 0.1 g L⁻¹ of different CNM.

Sample	Rate (a.u./day)			Products (%)		
	P1	P2	Aniline	P1	P2	Aniline
Control	2,505,302	132,558	1,271,117	65.3	3.4	31.3
CNT	3,705,959	192,570	3,577,374	64.3	2.5	33.2
CNT_N_MB	9,302,119	192,326	4,512,093	64.5	2.6	32.9
CNT_HNO ₃	5,100,658	190,930	3,223,832	64.0	2.6	33.4
CNT@2%Fe	4,901,623	189,295	3,271,333	64.2	2.7	33.1
CNT@2%Fe_N_MB	5,076,623	239,571	2,919,967	62.9	3.4	33.7
CNT@2%Fe_HNO ₃	3,105,069	n.d.	2,012,016	70.4	n.d.	29.6

n.d. – Not determined.

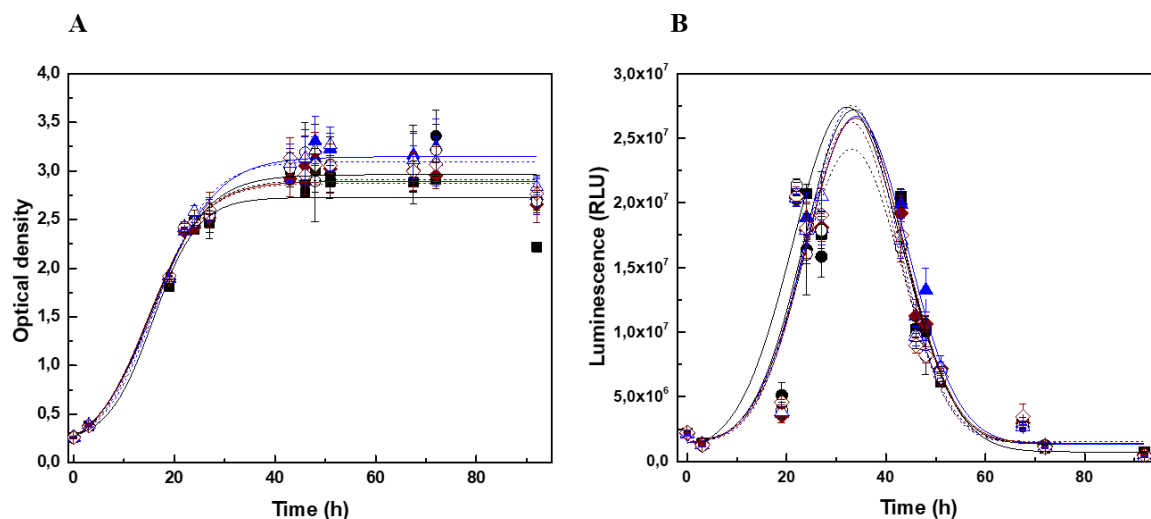


Figure S1. Effect of CNM on *Vibrio fischeri* growth (A) and luminescence emission (B): Control without CNM (■); CNT (●); CNT_N_MB (▲); CNT_HNO₃ (◆); CNT@2%Fe (○); CNT@2%Fe_N_MB (△); CNT@2%Fe_HNO₃ (◇).

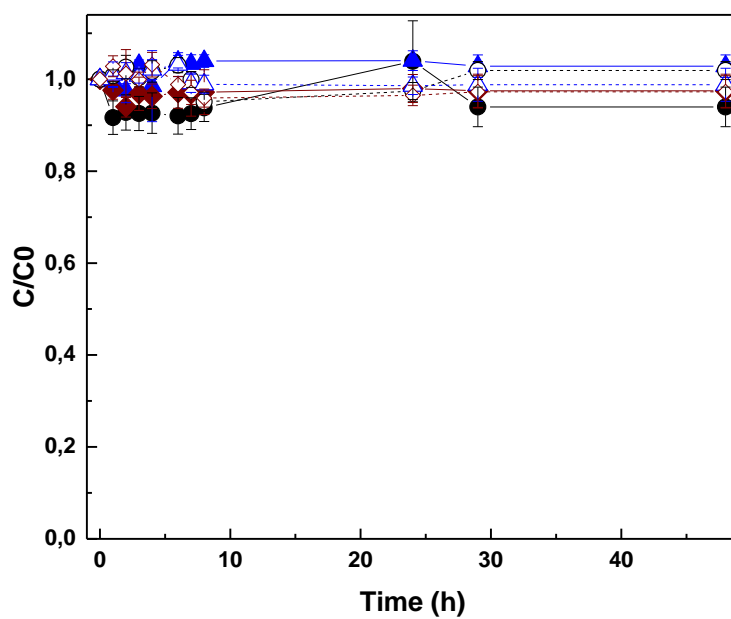


Figure S2. AO10 concentration over 48 h of reaction time, in abiotic conditions, in the presence of different CNM: CNT (●); CNT_N_MB (▲); CNT_HNO₃ (◆); CNT@2%Fe (○); CNT@2%Fe_N_MB (△); CNT@2%Fe_HNO₃ (◇).

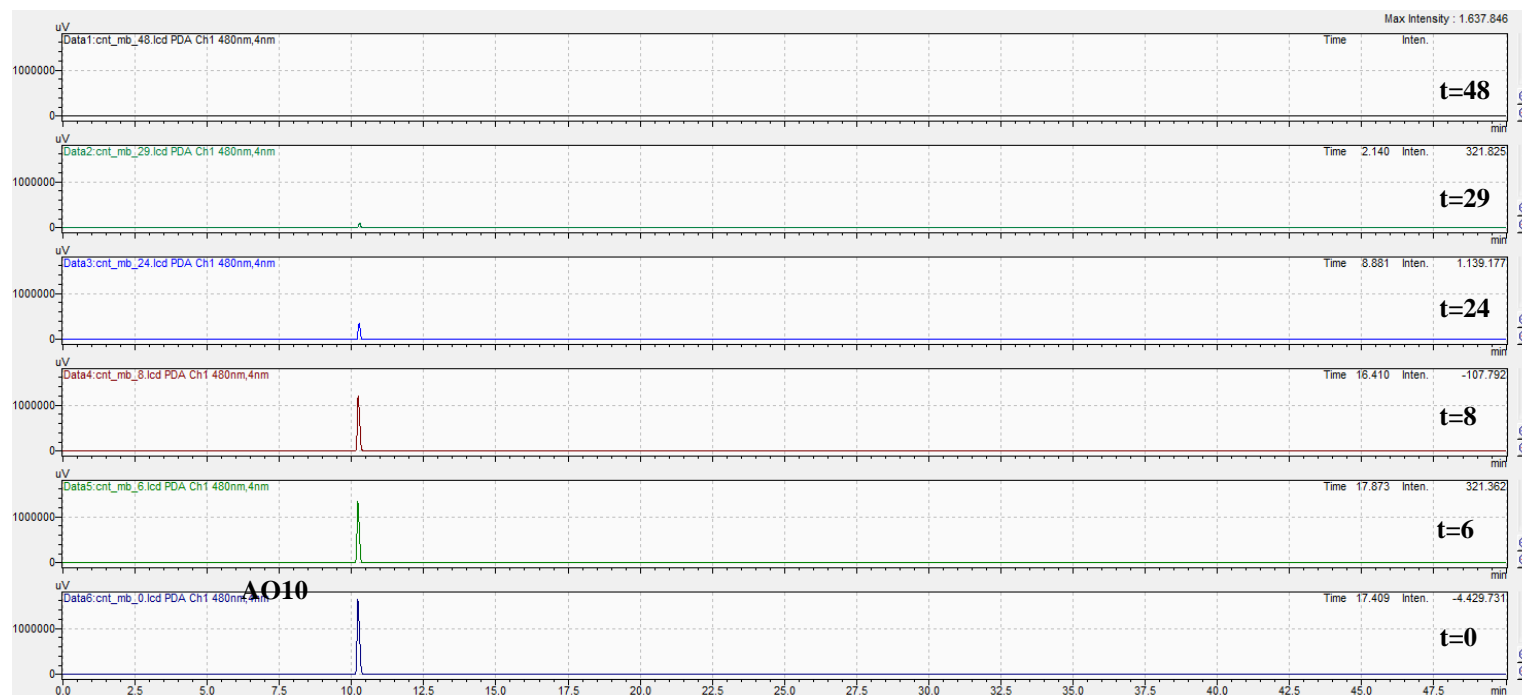


Figure S3. HPLC chromatograms of biological reduction of AO10, in the presence of CNT_N_MB, during 48 h of reaction as monitored at 480 nm. AO10 was detected at RT = 10.2 min.

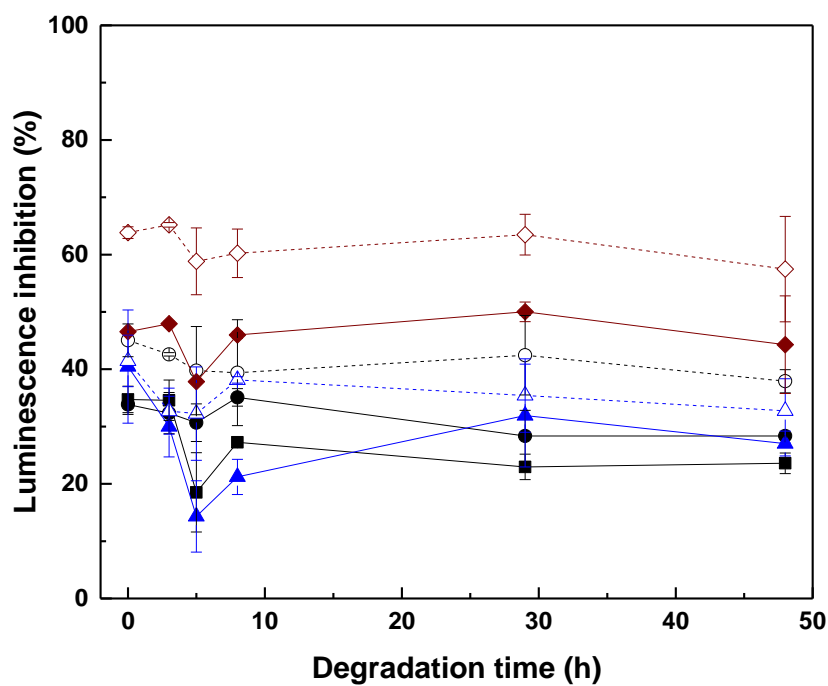


Figure S4. Toxicity of AO10 treatment samples over the degradation time, in the presence of 0.1 g L^{-1} of CNM, towards *Vibrio fischeri*. Control without CNM (■); CNT (●); CNT_N_MB (▲); CNT_HNO₃ (◆); CNT@2%Fe (○); CNT@2%Fe_N_MB (△); CNT@2%Fe_HNO₃ (◇).