Electronic Supplementary Material (ESI) for Environmental Science: Water Research & Technology.
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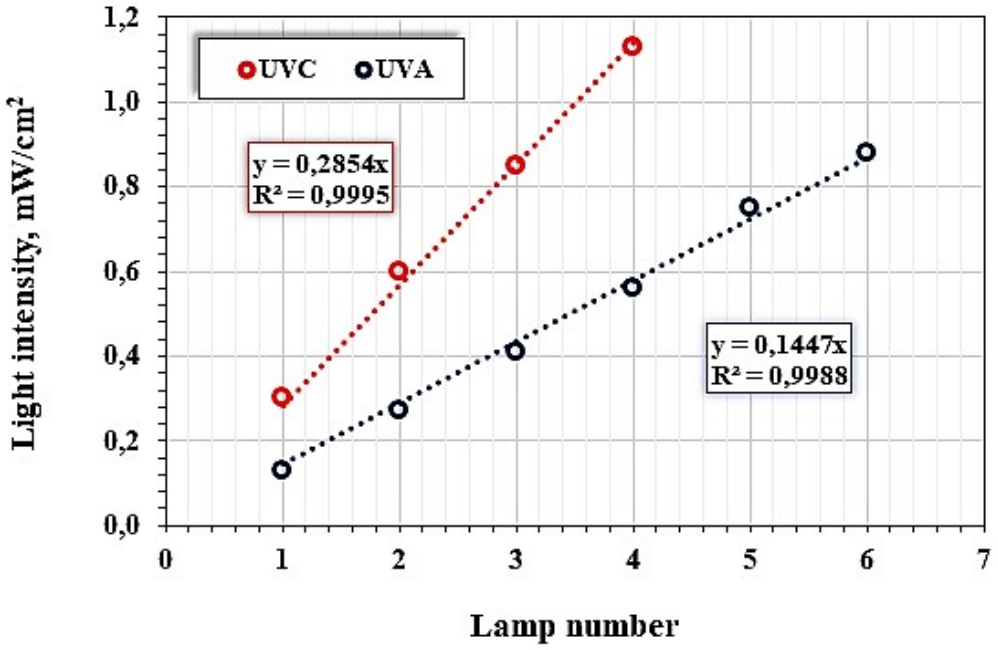
Supplementary Table 1. Measurement methods of parameters

Parameter	Unit	Methods
pH	-	Hach HQ440d (Hach-Lange GmBH) multiparameter
Temperature	ºC	Hach HQ440d (Hach-Lange GmBH) multiparameter
E_i	μS/cm	Hach HQ440d (Hach-Lange GmBH) multiparameter
TDS (Total Dissolved Solids)	mg/L	Hach HQ440d (Hach-Lange GmBH) multiparameter
DO (Dissolved Oxygen)	mg/L	Hach HQ440d (Hach-Lange GmBH) multiparameter
COD (Chemical Oxygen Demand)	mg/L	5220-C closed reflux titration method
TOC (Total Organic Carbon)	mg/L	5310-B high temperature catalytic oxidation method (Teledyne Tekmar analyzer)
SS (Suspended Solid)	mg/L	drying at about 103–105 °C in accordance with 2540-D gravimetric method
AOX (Adsorbable Organic Halogen)	mg/L	5910 B: UV Absorption method (LZC390/LCK390 AOX)
Turbidity	NTU	2310-B Nephelometric method (Hach 2100Q portable turbidimeter)
Ammonium	mg/L	4500-NH_3 B. Preliminary distillation method
Color	λ:436 nm	2120-C spectrophotometric method (Hach DR6000 UV VIS spectrophotometer)
	λ:525 nm	
	λ:620 nm	
NO_3^{2-}	mg/L	4500-NO_3^{2-}-C spectrophotometric method (Hach DR6000 UV VIS spectrophotometer)
SO_4^{2-}	mg/L	4500-D turbidity method (Hach DR6000 UV VIS spectrophotometer)
Cl^-	mg/L	4500-E potentiometric methods (Hach DR6000 UV VIS spectrophotometer)
Fe^{2+}	mg/L	Specthrometric Fe^{2+} analysis (Hach DR6000 UV VIS spectrophotometer)
Fe^{3+}	mg/L	Specthrometric Fe^{3+} analysis (Hach DR6000 UV VIS spectrophotometer)
Total Nitrogen	mg/L	LCK 330 Hach Lange test kits (Hach DR6000 UV VIS spectrophotometer)
Total Hardness	mg/L	2340C-EDTA titrimetric method
Total Phenol	mg/L	5530-C chloroform extraction method



Supplementary Figure 1. Variations of intensity of light versus lamp number in lab-pilot scale MOR.

Supplementary Table 2. The operating conditions optimized for Fenton and Photo-Fenton (UVA_{365} and UVC_{254}) enhanced UF hybrid systems

Parameters	Unit	Fenton Enhanced UF	UVA_{365} Enhanced UF	UVC_{254} Enhanced UF
Process time, t	min	56	42	60
Temperature, T	°C	39.1	30.7	40
pH	–	3.88	3.0	5.0
H_2O_2/TOC	g/g	6.0	9.4	6.0
H_2O_2/Fe^{2+}	g/g	11.1	6.0	7.0
Aeration rate, ν_A	L/min	2.56	3.0	2.0
Vacuum rate, $\nu_W{}^e$	rpm (mL/min)	55.0	55.0	55.0
UF membrane type	–	UH050	UP020	UH050
Lamp number, I_L		-	3	4
Intensity of light	mW/cm^2 (W)	–	0.4 (60)	0.6 (80)

Supplementary Table 3. Per round and total operational activities and operational MD concentrate recycle order for integrated {MOR}-[MD] systems.

Hybrid MOR treatment	Integrated UF membrane	Operation per treatment tour					Total MOR operation
		I. round	MD concentrate recirculation	II. round	MD concentrate recirculation	III. round	
Fenton enhanced {MOR}-[MD]	[UH050]	9 (504 min)		6 (336 min)		4 (224 min)	19 (1064 min)
UVA-Fenton enhanced {MOR}-[MD]	[UP020]	14 (588 min)		9 (378 min)		6 (252 min)	29 1218 min
UVC-Fenton enhanced {MOR}-[MD]	[UH050]	8 (480 min)		5 (300 min)		4 (240 min)	17 1020 min

Supplementary Table 4. Lab-pilot scale operating conditions in the MOR process.

MOR treatment	Parameters	Values
Fenton	Total Operating Time (h)	17.7
	Number of Operation	19
	Addition of raw wastewater to the reactor (L)	26
	Volume of water withdrawn from the reactor (L)	15
	MD concentrated recycle (L)	4
	HRT (h)	2
Photo-Fenton (UVA_{365})	Total Operating Time (h)	20.3
	Number of Operation	29
	Addition of raw wastewater to the reactor (L)	26
	Volume of water withdrawn from the reactor (L)	15
	MD concentrated recycle (L)	4
	HRT (h)	2
Photo-Fenton (UVC_{254})	Total Operating Time (h)	17
	Number of Operation	17
	Addition of raw wastewater to the reactor (L)	26
	Volume of water withdrawn from the reactor (L)	15
	MD concentrated recycle (L)	4
	HRT (h)	2