Supplementary material

Supplementary figures

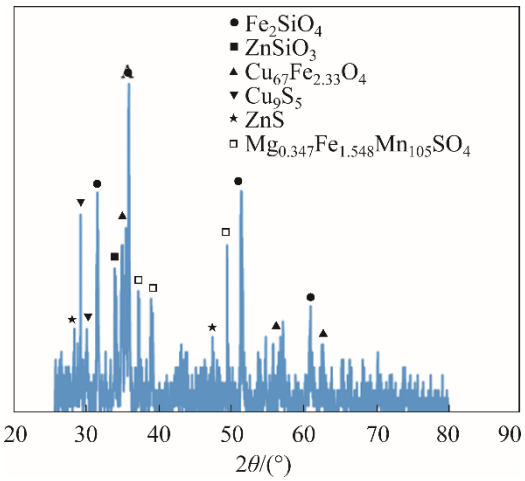

Figure S1 XRD pattern of the copper slags

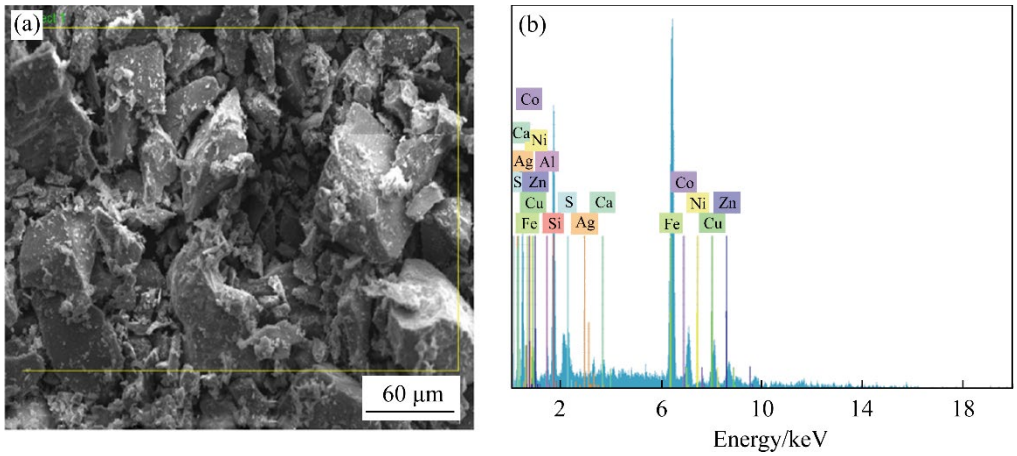

Figure S2 SEM microphotograph and EDX analysis of the copper slags

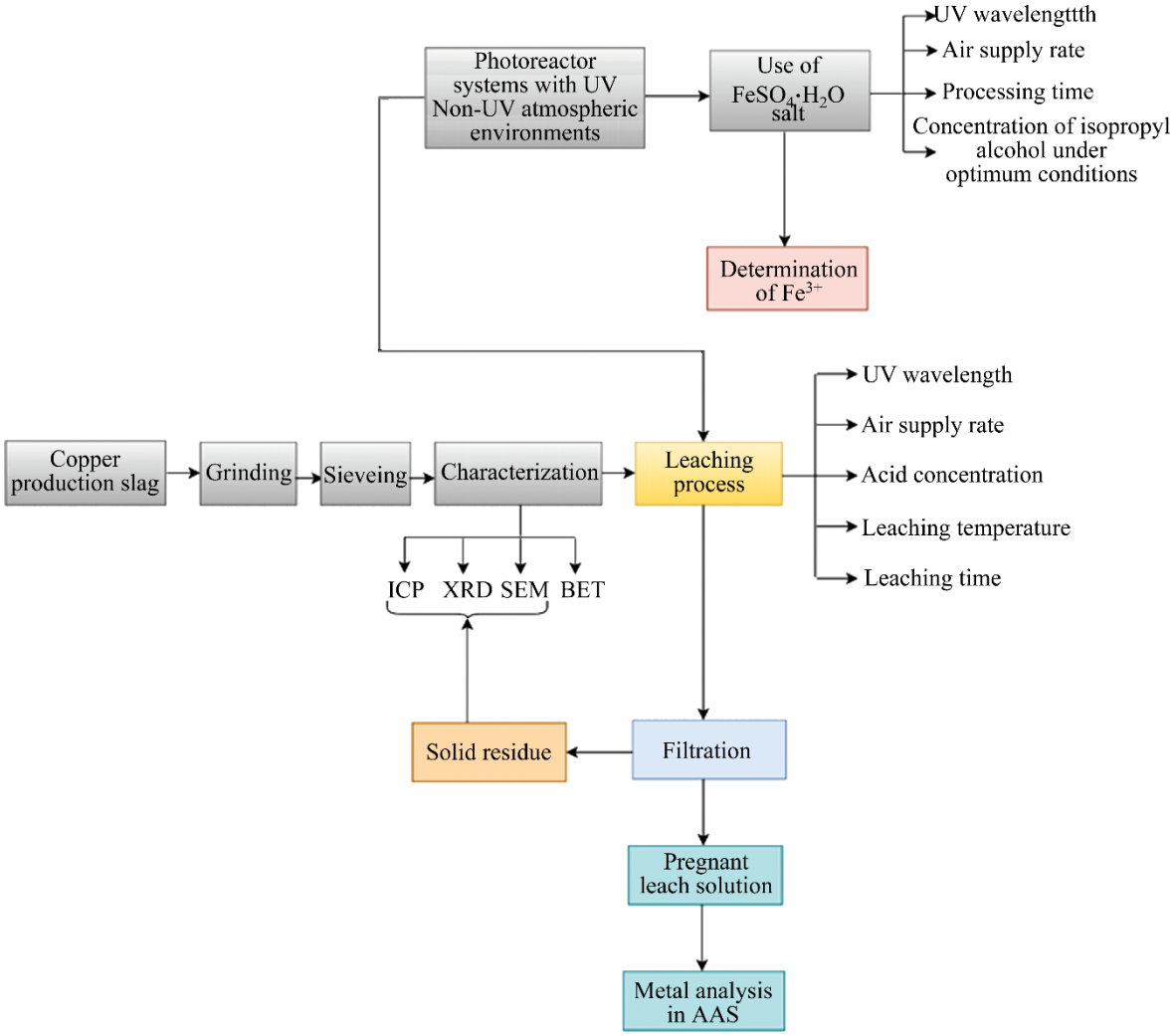

Figure S3 Proposed experimental flow sheet

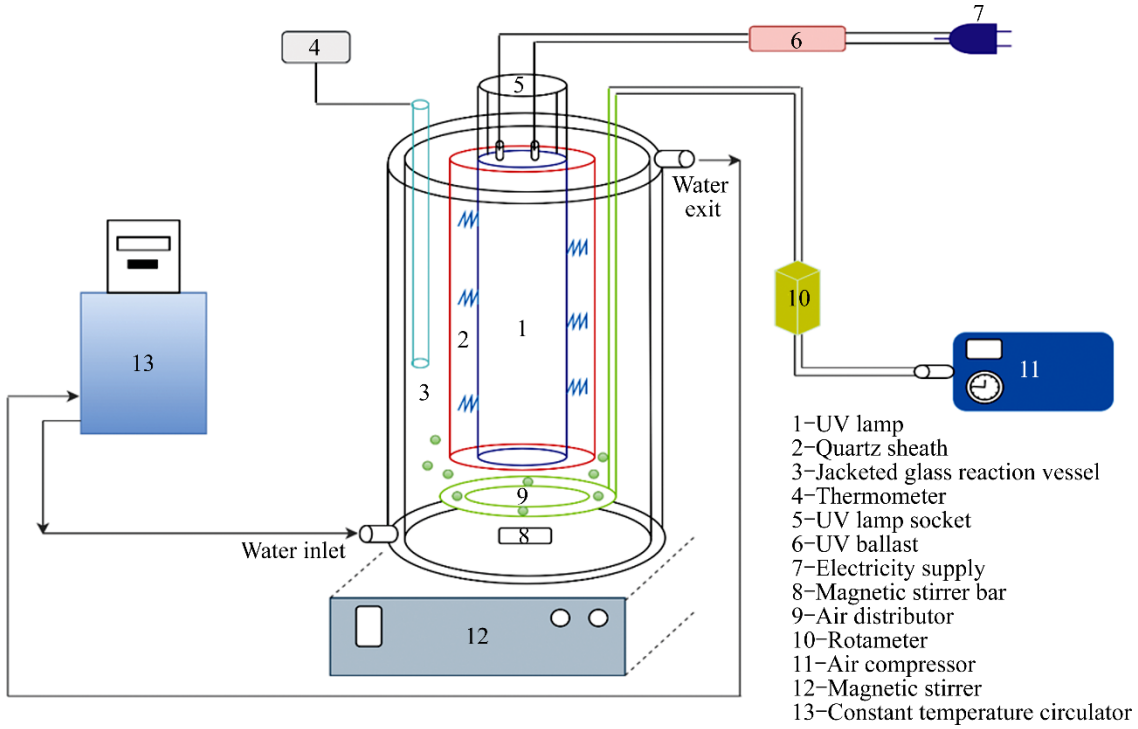

Figure S4 Schematic representation of the photoreactor system

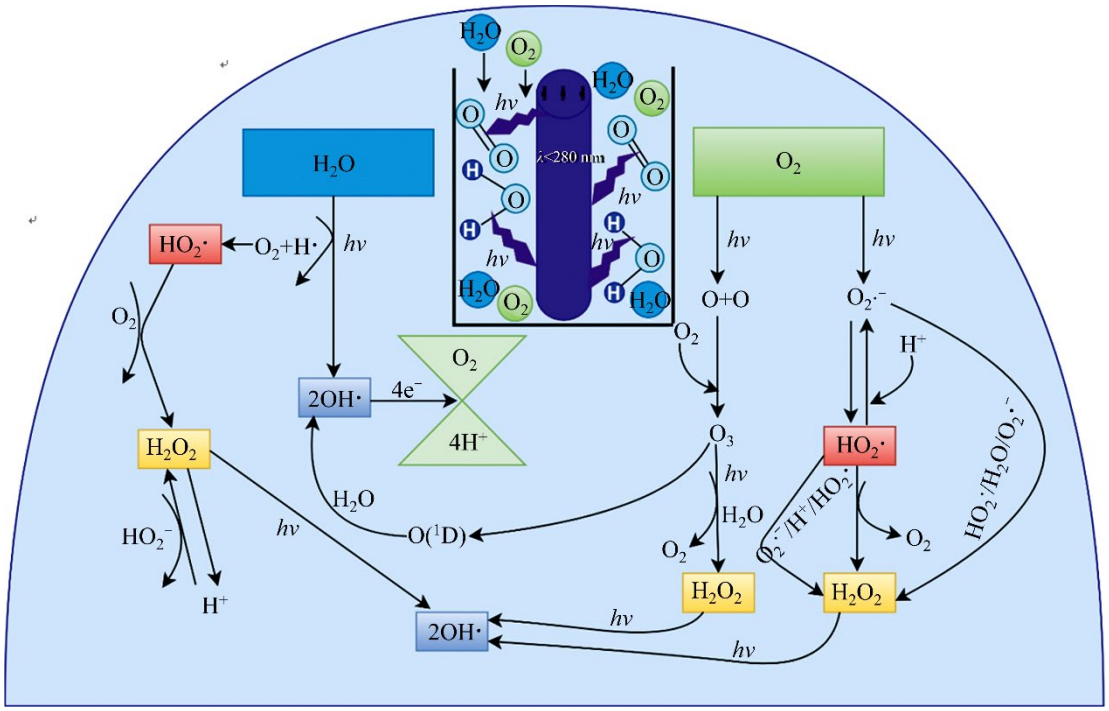

Figure S5 Schematic representation of possible formation and degradation of radical and oxidative species in an aqueous air supply environment in the presence of UV

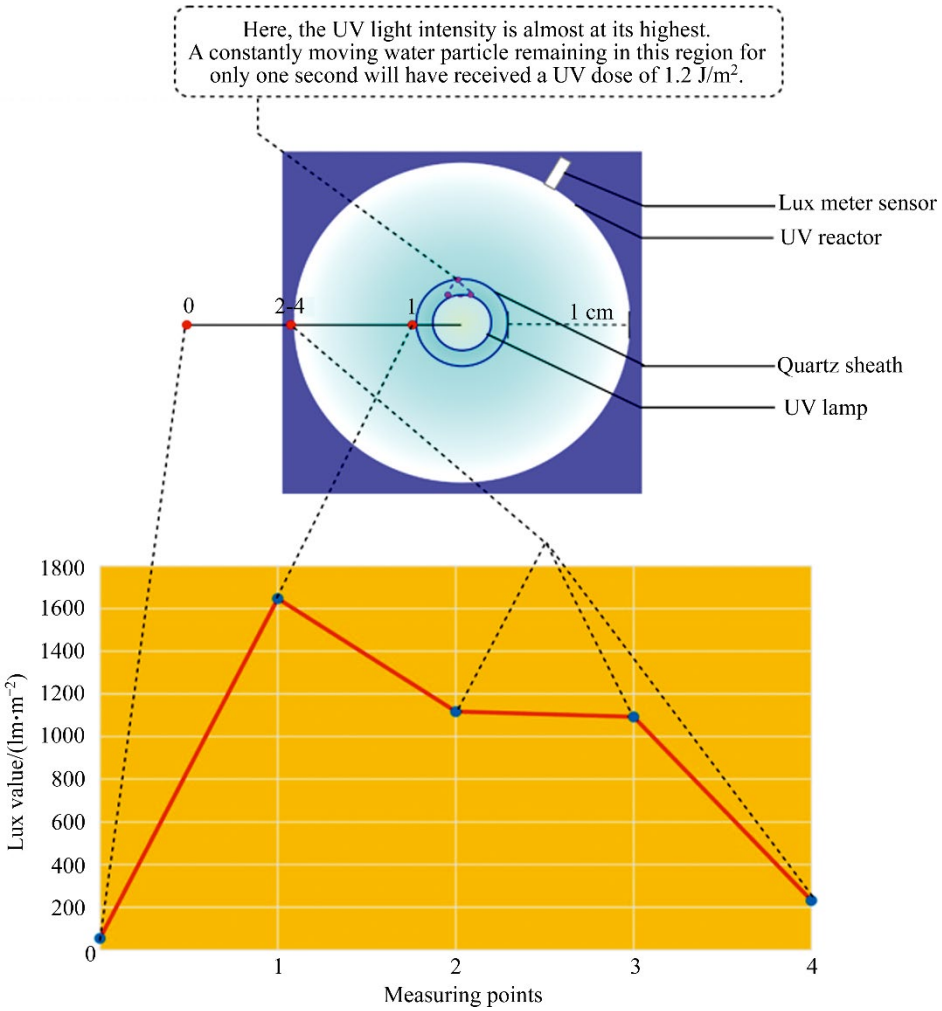

Figure S6 Beam distribution and lux value measurement results at different points/conditions in a central single UV (185nm-48W) lamp reactor

Supplementary tables

Table S1 Types of lamps with different wavelengths

UV lamp wavelength/nm	UV lamp power/W	Brand-model
185 (VUV)	48	Atlantic Ultraviolet-GPH436T5VH/HO
254 (UVC)	40	Lighttech- LT-GPH 436 T5L/4
311 (UVB)	36	Philips -PL-L 36W/01/4P 1CT
365 (UVA)	36	Philips -PL-L 36W/09/4P

Table S2 Chemical composition of the leach residue obtained in UV light environment under optimum conditions

wt%

Cu	Fe	S	Co	Pb	Zn	Mn	Ni	Mo	Ag	Cr	Bi
1.3	2.4	3.54	0.06	0.4	1.32	0.005	0.002	0.007	0.005	0.006	0.002

Table S3 Total energy consumption amount and cost of lamp against difference in amount of metal dissolution caused by UV (185 nm) light at optimum point

Metal dissolution amount difference caused by UV light/(g·L^{-1})	Electrical energy consumption amount/(kW·h)	Cost/USD
0.2 Cu^{2+}	0.144	0.02750