Electronic Supplementary Material (ESI) for RSC Advances.

Synthesis of Plasmonic AgCl and Oxygen-rich $Bi_{24}O_{31}Cl_{10}$ Composite Heterogeneous Catalyst for Enhanced Degradation of Tetracycline and 2,4-dichlorophenoxy acetic acid

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Number of Tables: 4

Number of Figures: 8

Table S 1: Physicochemical properties of model pollutants

Pollutant	Chemical formula	Chemical structure	Molecular weight	Solubility in water

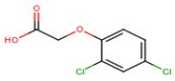
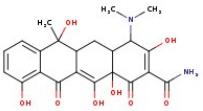
			(g/mol)	(mg/L)
2,4-dichlorophenoxy acetic acid (2,4-D)	$C_8H_6Cl_2O_3$		221.09	900
Tetracycline (TC)	$C_{22}H_{24}N_2O_8$		444.435	231

Table S 2: Elemental analysis of as-prepared $Bi_{24}O_{31}Cl_{10}$

Element	Wt%	Wt% Sigma
O	9.69	
Cl	5.92	0.11
Bi	84.39	0.21
Total:	100.00	

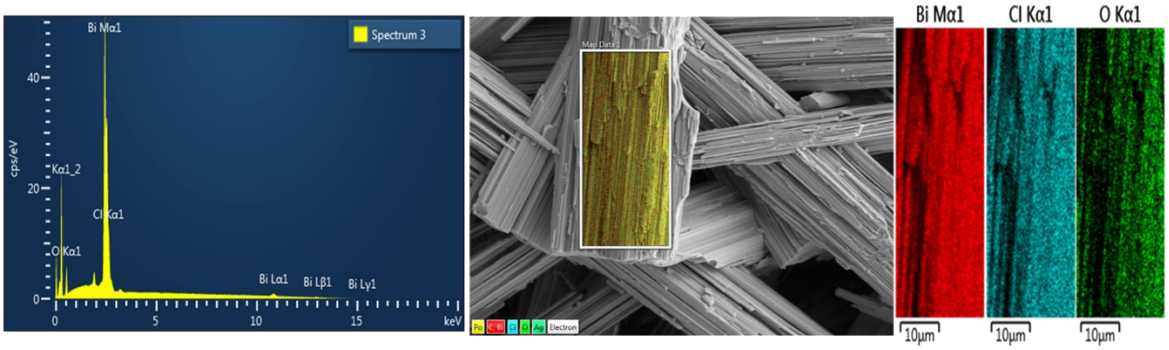


Figure S 1: SEM-EDS mapping of $Bi_{24}O_{31}Cl_{10}$

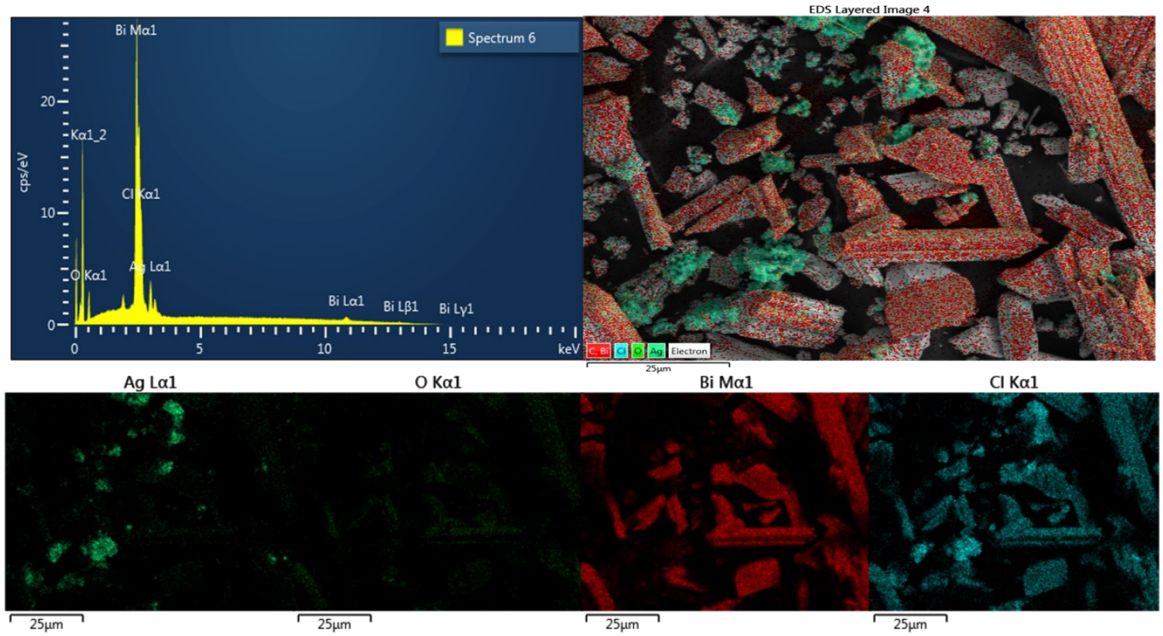


Figure S 2: SEM-EDS mapping of 10%AgCl/$Bi_{24}O_{31}Cl_{10}$

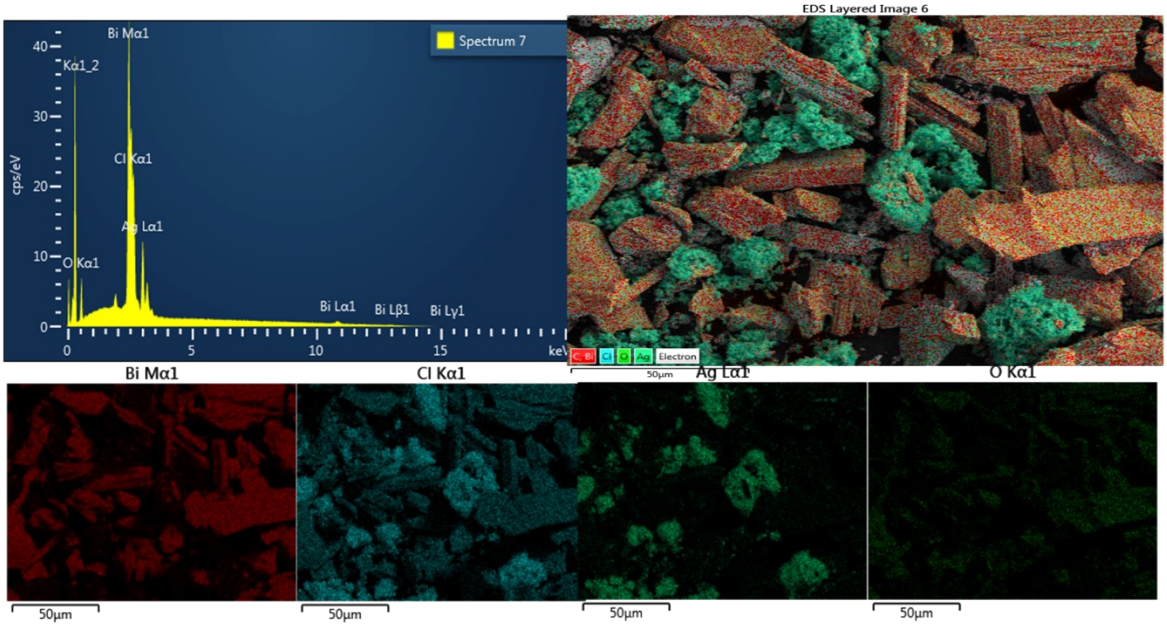


Figure S 3: SEM-EDS mapping of 20%AgCl/$Bi_{24}O_{31}Cl_{10}$

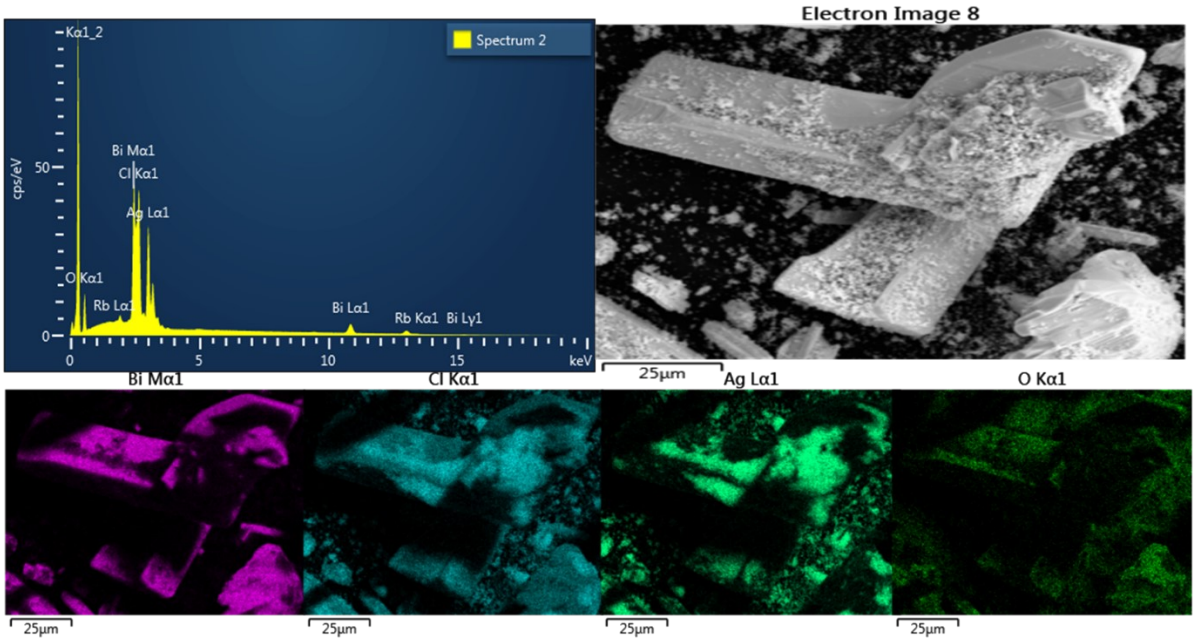


Figure S 4: SEM-EDS mapping of 50%$Bi_{24}O_{31}Cl_{10}$

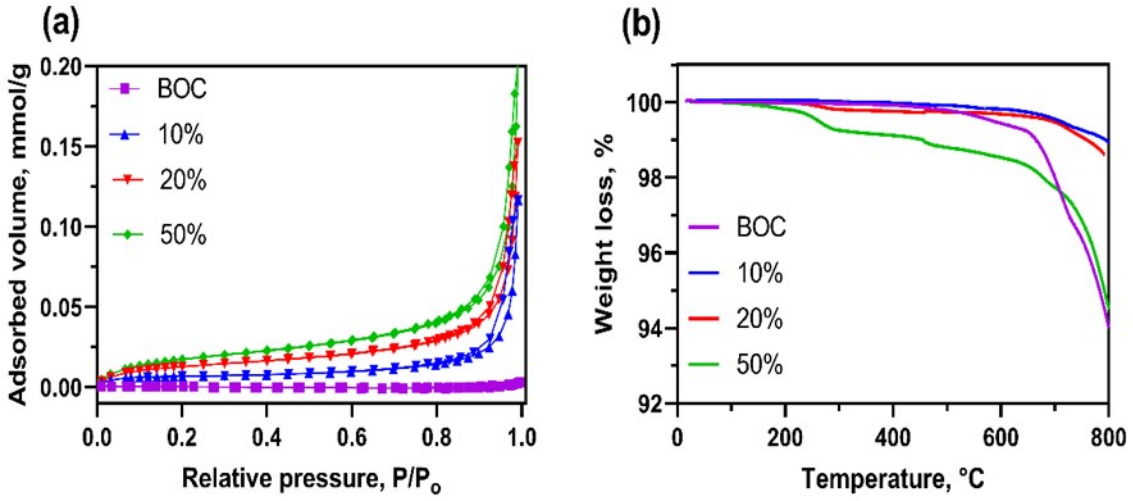


Figure S 5: (a) N_2 adsorption-desorption isotherms and BET surface area of BOC, 10%AgCl/BOC, 20%AgCl/BOC and 50%AgCl/BOC, (b) TGA curves of as-synthesised photocatalysts

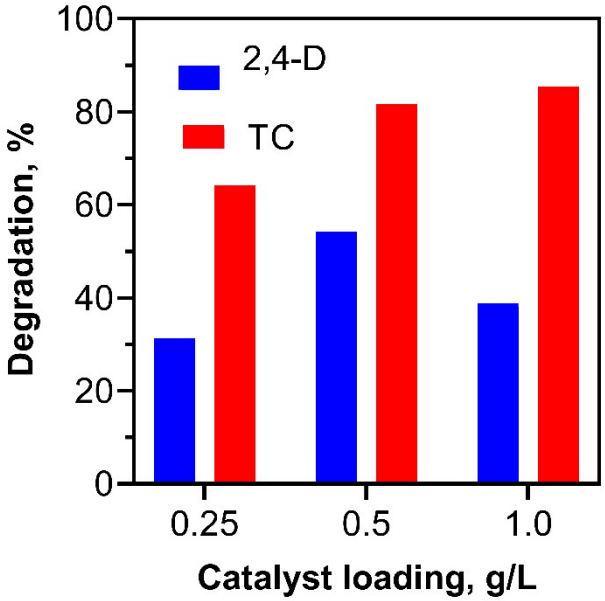


Figure S 6: Effect of photocatalyst loading in 2,4-D and TC

Table S 3: Kinetic parameters for 2,4-D

Variable parameter	Value	K (min^{-1})			R^2		
		Zero-order	First-order	Second-order	Zero-order	First-order	Second-order
Catalyst[a]	BOC	-8E-05	8E-05	9E-05	0.0419	0.043	0.0442
	10%AgCl/BOC	-18E-04	0.0025	0.0035	0.9757	0.9919	0.9925
	20%AgCl/BOC	-0.002	0.0029	0.0045	0.9282	0.9692	0.9937
	50%AgCl/BOC	-18E-04	0.0031	0.0048	0.9235	0.9649	0.9902
Photocatalyst loading[b]	0.25 g/L	-12E-04	0.0014	0.0018	0.8062	0.8244	0.8418
	0.5 g/L	-0.0020	0.0029	0.0045	0.9282	0.9692	0.9937
	1 g/L	-13E-04	0.0017	0.0023	0.6912	0.7195	0.7373
Initial concentration[c]	10 mg/L	-0.0021	0.003	0.0044	0.8712	0.8819	0.8776
	20 mg/L	-0.002	0.0029	0.0045	0.9282	0.9692	0.9937
	50 mg/L	-9E-04	0.001	0.0012	0.5771	0.562	0.5454
Solution pH[d]	3	-0.002	0.0029	0.0046	0.8811	0.9264	0.9582
	4	-0.002	0.0029	0.0045	0.9282	0.9692	0.9937
	7	-9E-04	0.0011	0.0013	0.941	0.9511	0.9556
	11	0.0002	-2E-04	-2E-04	0.1313	0.1195	0.1080

[a] photocatalyst loading = 0.5 g/L, concentration = 20 mg/L, pH= 4

[b] catalyst = 20%AgCl/BOC, concentration = 20 mg/L, pH = 4

[c] catalyst = 20%AgCl/BOC, photocatalyst loading = 0.5 g/L, pH = 4

[d] catalyst = 20%AgCl/BOC, photocatalyst loading = 0.5g/L, concentration = 20 mg/L

Table S 4: Kinetic parameters for TC

Variable parameter	Value	K (min^{-1})			R^2		
		Zero-order	First-order	Second-order	Zero-order	First-order	Second-order
Catalyst[e]	BOC	-8E-04	0.0009	0.0011	0.6759	0.6798	0.6821
	10%AgCl/BOC	-0.0016	0.0024	0.0037	0.6190	0.6715	0.7155
	20%AgCl/BOC	-0.0021	0.0034	0.0060	0.6870	0.7238	0.7546
	50%AgCl/BOC	-0.0028	0.0062	0.0165	0.8052	0.9196	0.9882
Photocatalyt loading[f]	0.25 g/L	-0.0023	0.0038	0.0070	0.8530	0.9152	0.9340
	0.5 g/L	-0.0028	0.0062	0.0165	0.8052	0.9196	0.9882
	1 g/L	-0.0029	0.0073	0.0238	0.7812	0.9098	0.9631
Initial concentration[g]	20 mg/L	-0.0029	0.0073	0.0238	0.7812	0.9098	0.9631
	30 mg/L	-0.0028	0.0058	0.0141	0.9011	0.9733	0.9769
	50 mg/L	-0.0021	0.0320	0.0051	0.9136	0.9416	0.9400
Solution pH[h]	3	-0.0030	0.0069	0.0202	0.8708	0.9671	0.9523
	5.3	-0.0029	0.0073	0.0238	0.7812	0.9098	0.9631
	7	-0.0031	0.0080	0.0027	0.8028	0.9183	0.9780
	11	-0.0032	0.0081	0.0282	0.7052	0.7596	0.8204

[e] photocatalyst loading = 0.5 g/L, concentration = 20 mg/L, pH= 5.3

[f] Catalyst = 50%AgCl/BOC, concentration = 20 mg/L, pH = 5.3

[g] Catalyst = 50%AgCl/BOC, photocatalyst loading = 1 g/L, pH = 5.3

[h] Catalyst = 50%AgCl/BOC, photocatalyst loading = 1 g/L, concentration = 20 mg/L

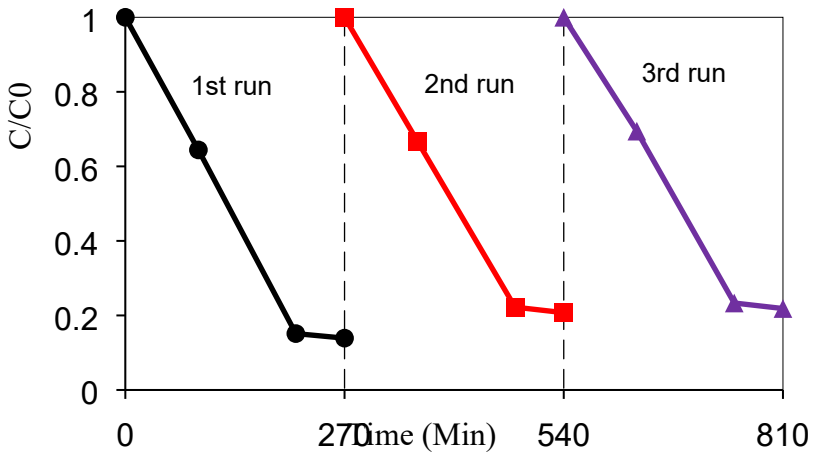


Figure S 7: Cycles of 50%AgCl/BOC in the photocatalytic degradation of TC in visible light

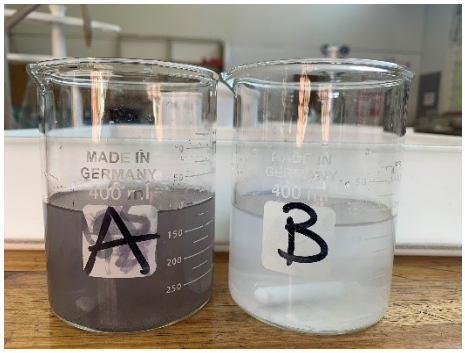


Figure S 8: (A) 50%AgCl/$Bi_{24}O_{31}Cl_{10}$ irradiated in light and (B) 50%AgCl/$Bi_{24}O_{31}Cl_{10}$ in the dark