

1 *Supplementary materials*

2 **Enhanced activation of persulfate by Co-doped**
 3 **bismuth ferrite nanocomposites for degradation of**
 4 **levofloxacin under visible light irradiation**

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10 **Table S1.** the structural refinement of BFO and Co-BFO sample.

Samples	a	b	c	Unit volume	Crystallin e size	refined data
BFO	8.0278	8.4161	6.0219	406.86	41.2	1
Co-BFO-1	8.0264	8.4124	5.985	404.11	42.1	—
Co-BFO-2	8.0263	8.418	5.983	404.24	42.3	0.013909
Co-BFO-3	8.0261	8.417	5.978	403.85	44.6	—
Co-BFO-4	8.0154	8.412	5.94986	401.17	46.6	—

11 **Table S2.** Abbreviated symbols of samples with different amount of Co.

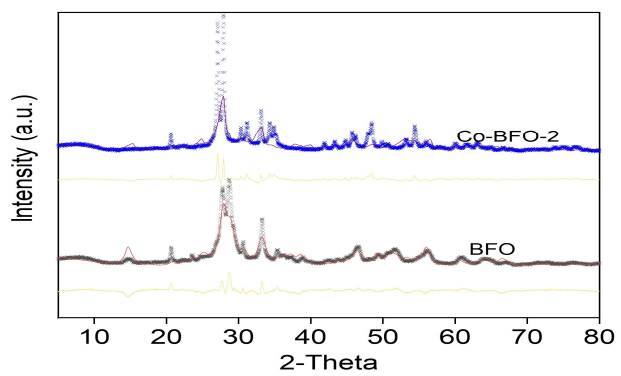
Sample abbreviation	Cobalt percentage	Stoichiometric molar ratio Bi:Fe:Co	Chemical Formula
BFO	0	1:2:0	$\text{Bi}_2\text{Fe}_4\text{O}_9$
Co-BFO-1	0.01	1:1.98:0.02	$\text{Bi}_2\text{Fe}_{3.96}\text{Co}_{0.04}\text{O}_9$
Co-BFO-2	0.02	1:1.95:0.05	$\text{Bi}_2\text{Fe}_{3.9}\text{Co}_{0.1}\text{O}_9$
Co-BFO-3	0.03	1:1.93:0.07	$\text{Bi}_2\text{Fe}_{3.86}\text{Co}_{0.14}\text{O}_9$
Co-BFO-4	0.05	1:1.9:0.1	$\text{Bi}_2\text{Fe}_{3.8}\text{Co}_{0.2}\text{O}_9$

12 **Table S3.** Studies on of various contaminant using bismuth ferrite and metal doped bismuth ferrite
 13 catalysts.

No	Systems	Light source	Target pollutant	Reaction time and efficiency	Operation parameters
1	Co/BiFeO ₃ composite/ peroxysulphate	none	tetracycline	60 min 81.09%	[peroxysulphate]=20 mg
2	Bi ₂ Fe ₄ O ₉ /peroxymonosulfate	none	sulfamethoxazole; e;	30 min >95%	pH =3.8, [PMS]=0.4 mM, [Bi ₂ Fe ₄ O ₉] =0.1 g L ⁻¹ , and [SMX] =20

								μM
3	0.5/Bi ₂₅ FeO ₄₀ /Bi ₂ Fe ₄ O ₉ /visible light	500 W Xe lamp	Rhodamine B	300 min 70%				10 mg/L RhB, [catalyst]=1.0 g L ⁻¹
4	Bi ₂ Fe ₄ O ₉ /peroxymonosulfate	none	sulfamethoxazole	30 min k=0.14 min ⁻¹				natural pH, [catalyst] = 0.1 g L ⁻¹ , [PMS] = 0.40 mM, CSMX = 20 M
5	Ag/Bi ₂ Fe ₄ O ₉ /visible light	500 W tungsten lamp	methyl orange (MO)	45 min 100%				[catalyst]= 3.0 g L ⁻¹
6	Co-doped BiFeO ₃ /visible light	300 W Xe lamp	methyl orange (MO)	120 min 89.8%				[MO]=10 mg L ⁻¹ , [catalyst]=1.0 g L ⁻¹
7	Er-doped BiFeO ₃ /visible light	300 W Xe lamp	tetracycline hydrochloride	180 min 75.8%				[catalyst]=2.0 g L ⁻¹ , [TC]=30 mg L ⁻¹
8	Sr and Co co-doped BiFeO ₃ /visible light	300 W Xe lamp	methyl orange (MO)	180 min 76%				[MO]= 5 mg L ⁻¹ ,
9	Co-BFO/PS/LED light (this work)	LED light	Levofloxacin (LFX)	60 min 100%				[LFX] = 15 mg L ⁻¹ , [Co-BFO] = 0.5 g L ⁻¹ , [PS] = 0.2 mM.

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Figure S1. Rietveld analysis results of BFO and Co doped BFO samples.