

## Electronic Supplementary Information

# Enhanced Photocatalytic Dehalogenation Performance of RuDoped In<sub>2</sub>O<sub>3</sub> Nanoparticles Induced by Oxygen Vacancy

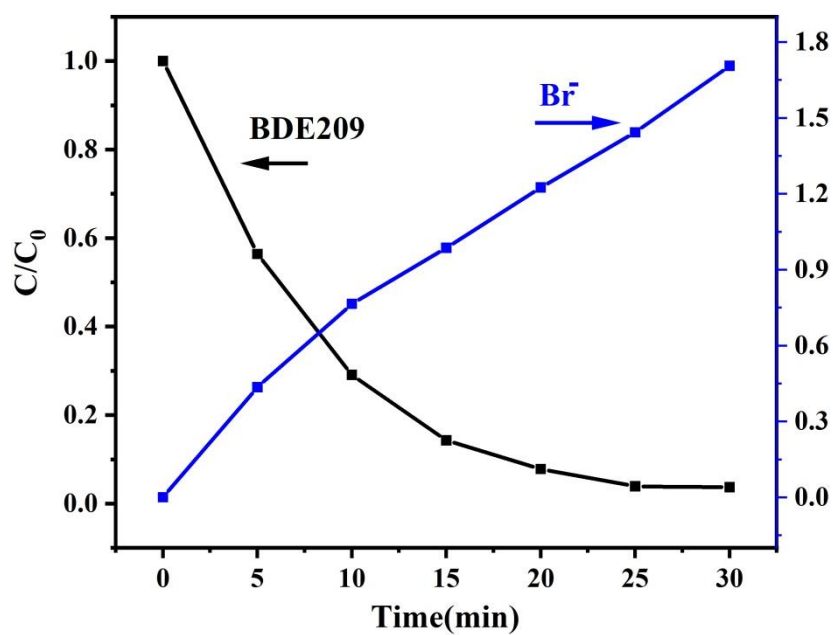
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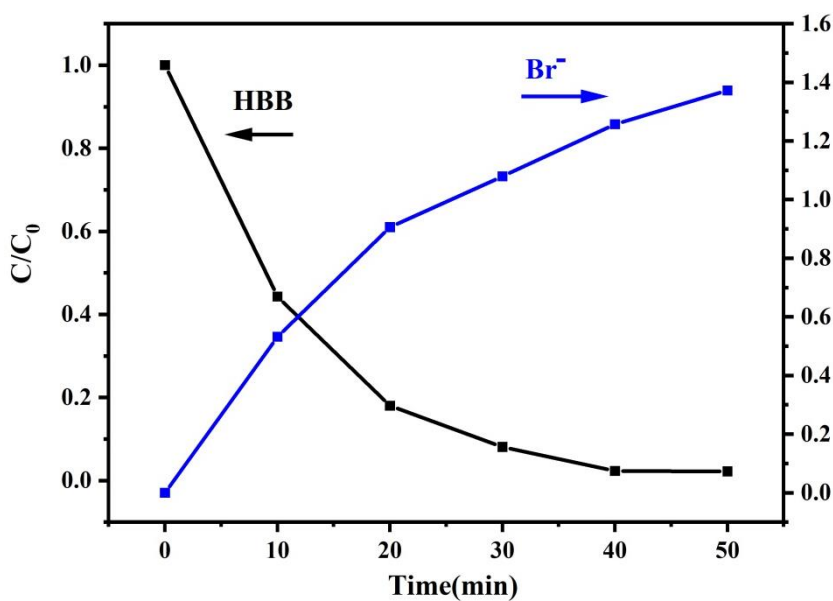
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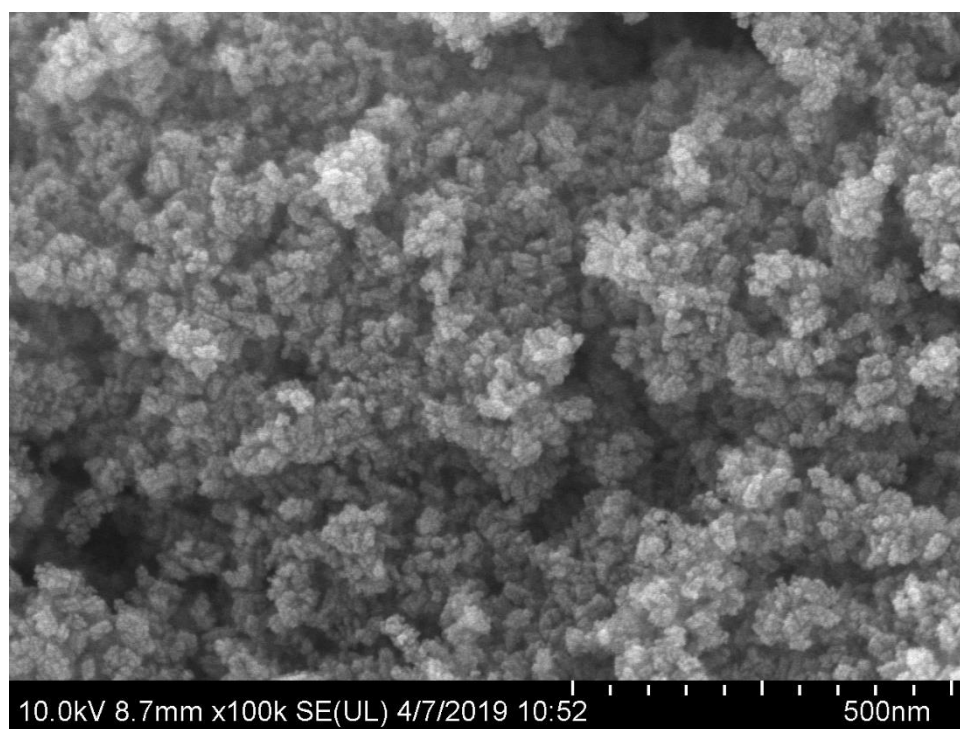
† These authors contributed equally to the this work.



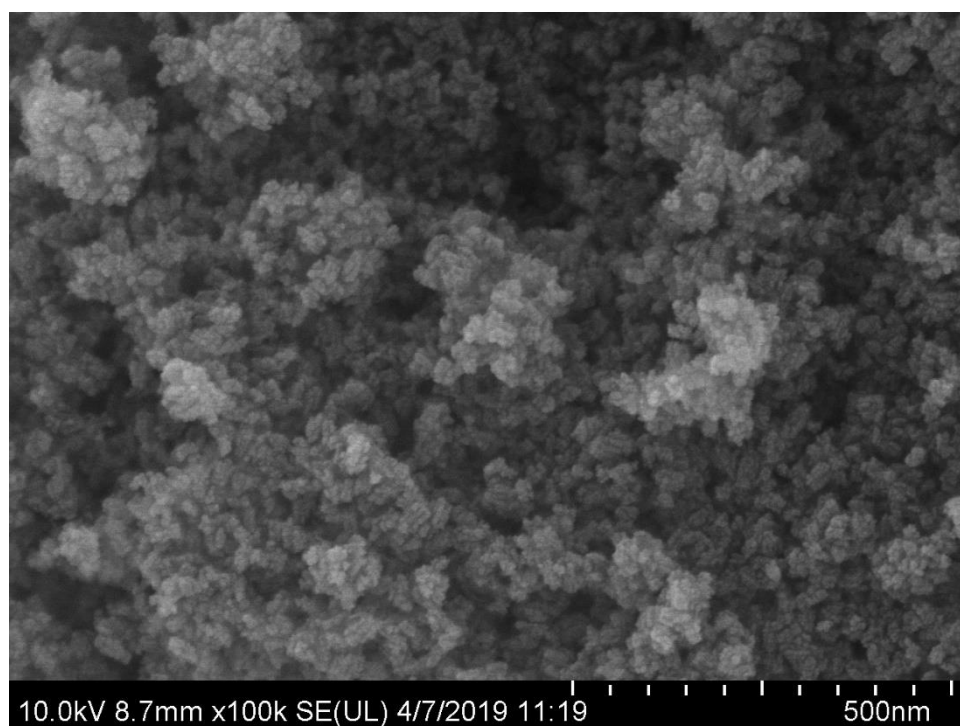
**Figure S1** The formation of bromide ion in the photocatalytic dehalogenation of Deca-BDE over the 0.5% Ru-In<sub>2</sub>O<sub>3</sub> samples.



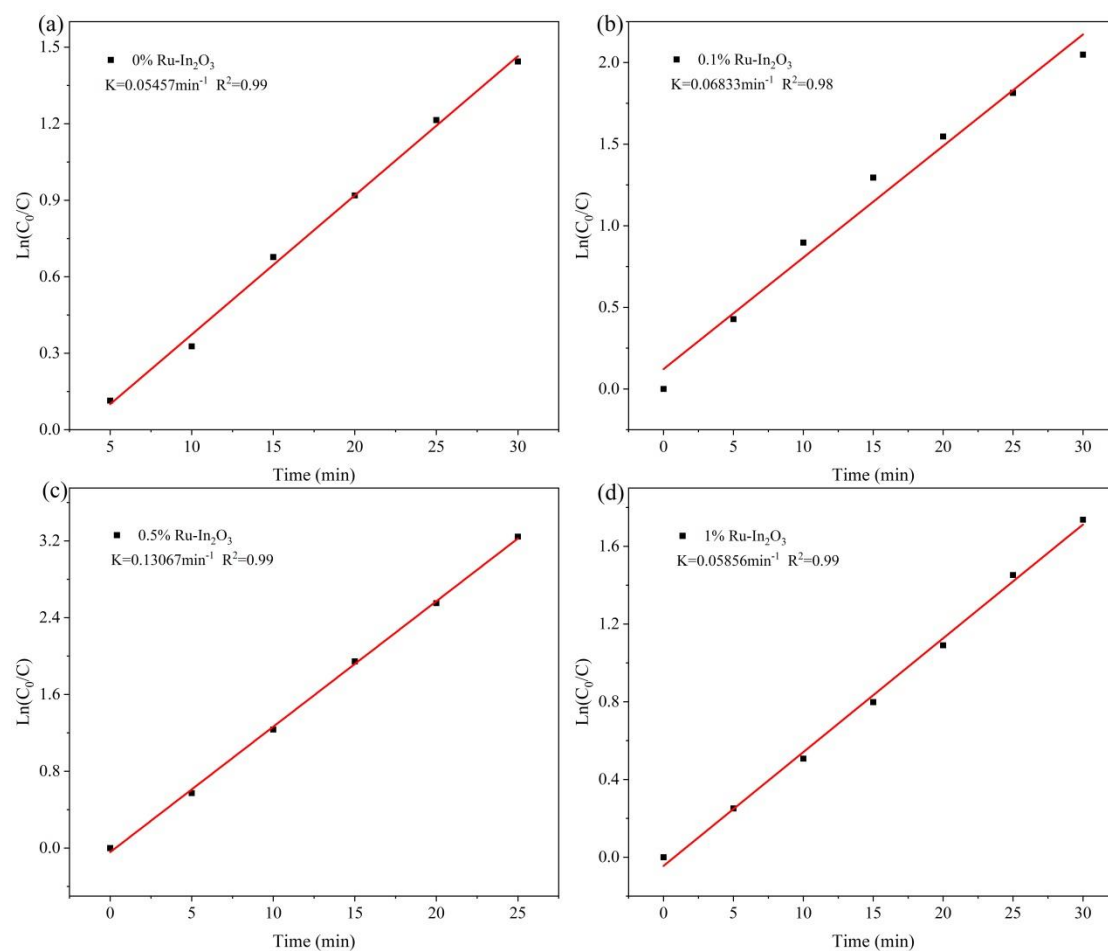
**Figure S2** The formation of bromide ion in the photocatalytic dehalogenation of Deca-BDE over the 0.5% Ru-In<sub>2</sub>O<sub>3</sub> samples.



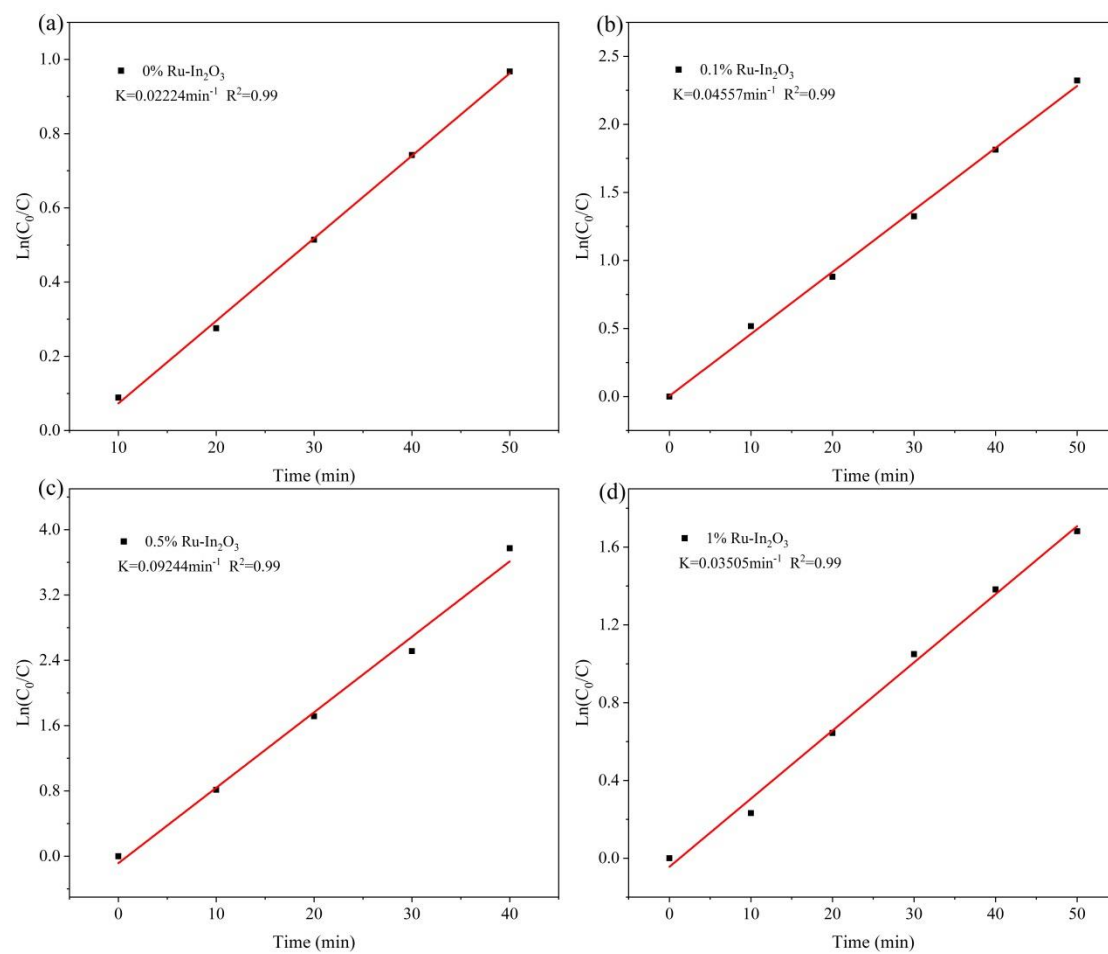
**Figure S3** SEM image of the 0% Ru-In<sub>2</sub>O<sub>3</sub> samples.



**Figure S4** SEM image of the 0.5% Ru-In<sub>2</sub>O<sub>3</sub> samples.



**Figure S5** Kinetic studies for the degradation of Deca-BDE over the different Ru-In<sub>2</sub>O<sub>3</sub> samples (a-d).



**Figure S6** Kinetic studies for the degradation of HBB over the different Ru-In<sub>2</sub>O<sub>3</sub> samples (a-d).

**Table S1** The comparison of the photocatalytic performances with other literature.

Entry	Control Conditions	Conversion Yield %	References
1	TiO <sub>2</sub> , Xe lamp irradiation ( $\lambda > 360$ nm), methanol as solvent, Time: 25 min, Dosage: 0.2 g/L	~12%	[40]
2	Cu/TiO <sub>2</sub> , Xe lamp irradiation ( $\lambda > 360$ nm), methanol as solvent, Time: 25 min, Dosage: 0.2 g/L	~90%	[40]
3	Ammonium-based In <sub>2</sub> O <sub>3</sub> , Xe lamp irradiation ( $\lambda > 300$ nm), methanol as solvent, Time: 100 min, Dosage: 0.33 g/L	~90%	[41]
4	Bicarbonate-based In <sub>2</sub> O <sub>3</sub> , Xe lamp irradiation ( $\lambda > 300$ nm), methanol as solvent, Time: 100 min, Dosage: 0.33 g/L	~45%	[41]
5	Urea-based In <sub>2</sub> O <sub>3</sub> , Xe lamp irradiation ( $\lambda > 300$ nm), methanol as solvent, Time: 100 min, Dosage: 0.33 g/L	~35%	[41]
6	Hydroxide-based In <sub>2</sub> O <sub>3</sub> , Xe lamp irradiation ( $\lambda > 300$ nm), methanol as solvent, Time: 100 min, Dosage: 0.33 g/L	~17%	[41]
7	g-C <sub>3</sub> N <sub>4</sub> , Xe lamp irradiation ( $\lambda > 360$ nm), methanol as solvent, Time: 60 min, Dosage: 1 g/L	~95%	[42]
8	Ru-In <sub>2</sub> O <sub>3</sub> , Xe lamp irradiation ( $\lambda > 400$ nm), methanol as solvent, Time: 25 min, Dosage: 0.75 g/L	97%	This work