Supplementary information

RuO$_2$ Two-Dimensional Nanosheets as Robust Catalyst for Peroxymonosulfate Activation

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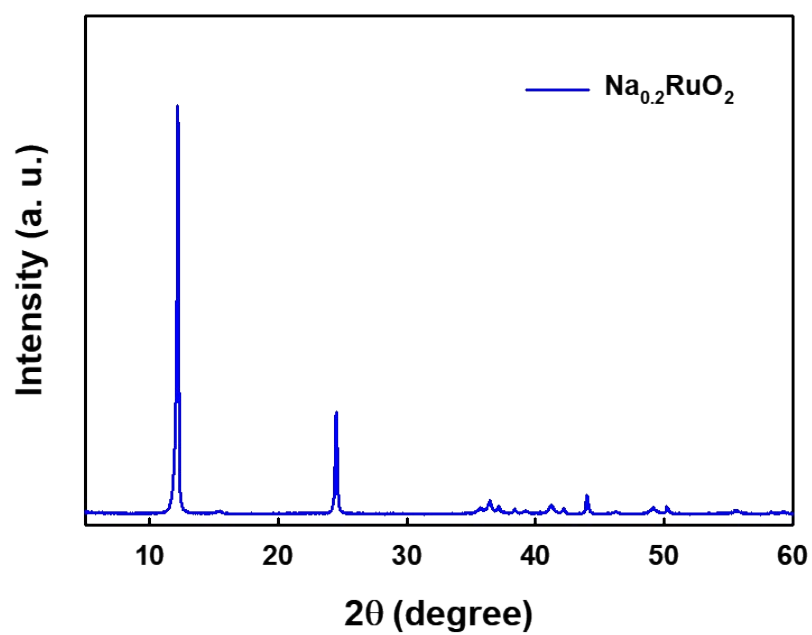
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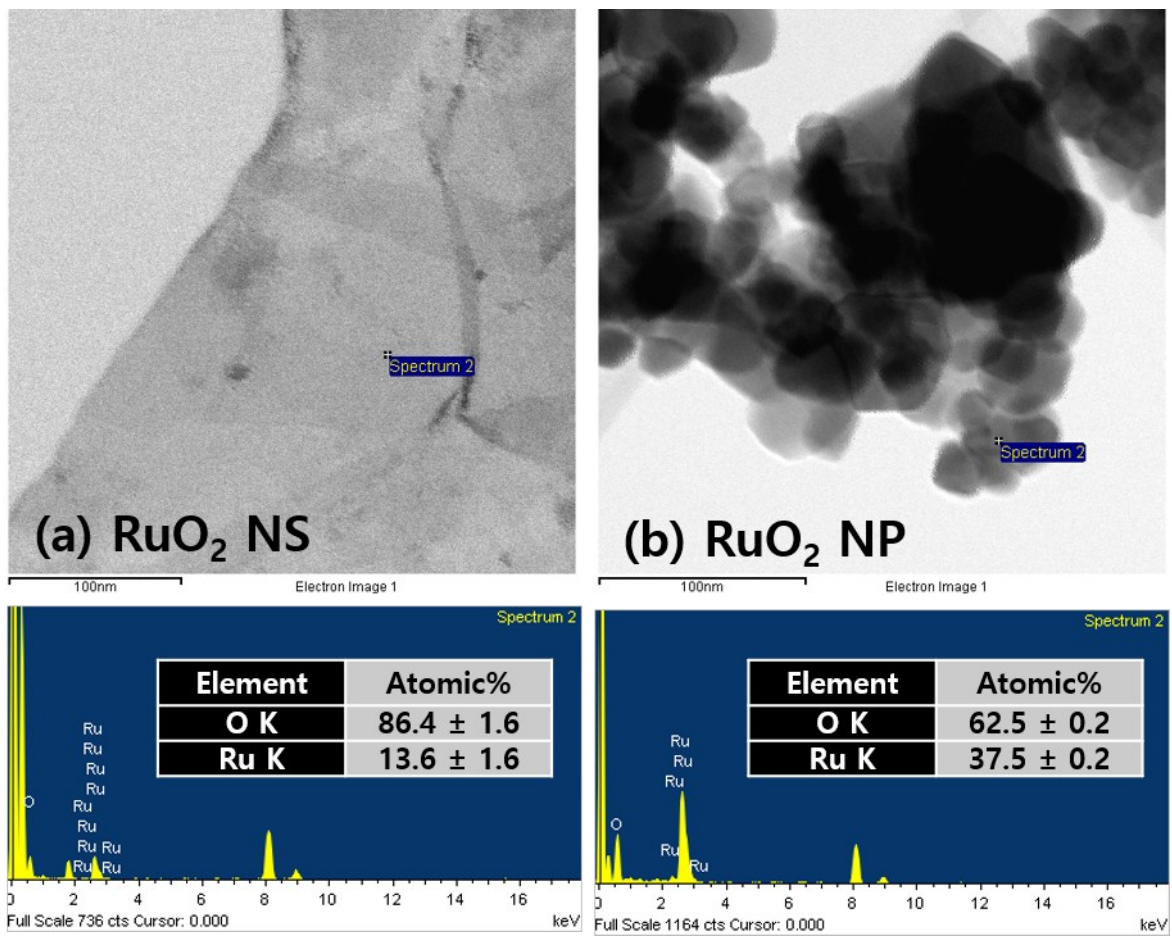
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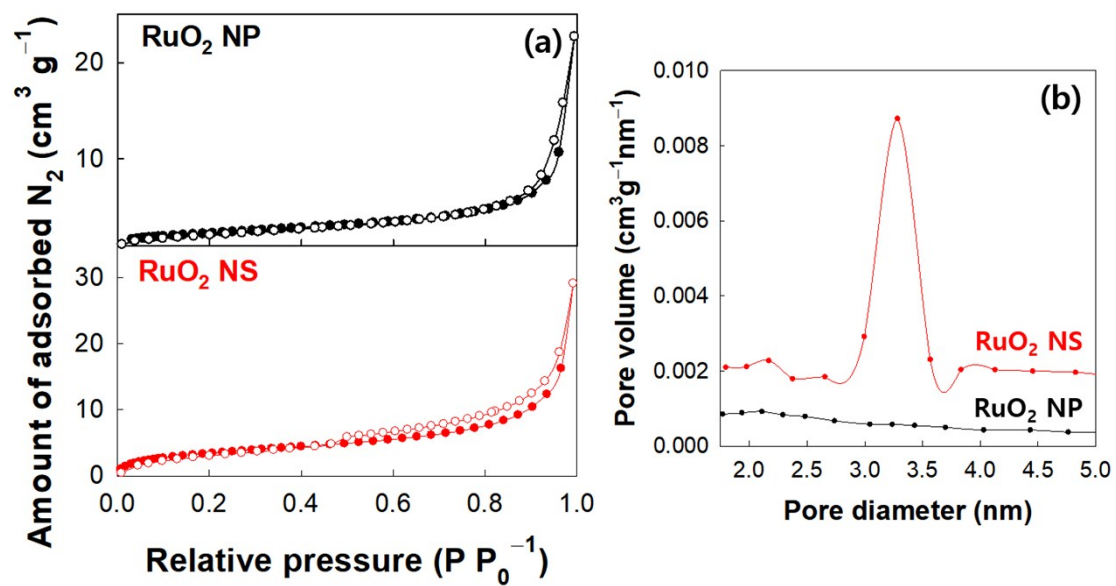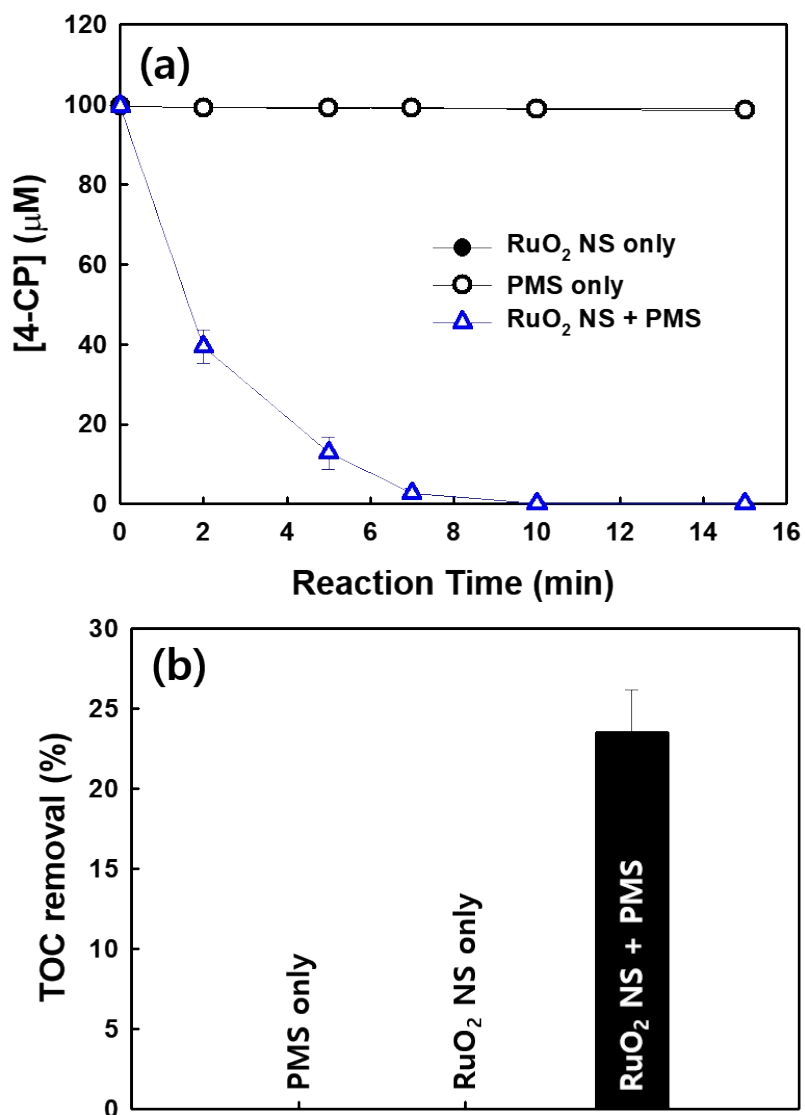E-mail: lee39@korea.ac.kr (J. L.); Phone: +82-2-3290-4864
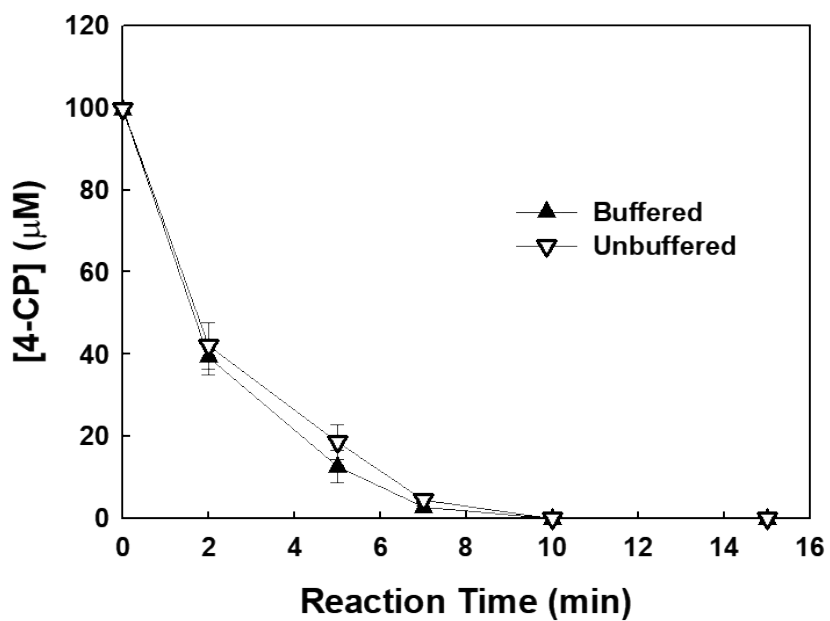
Fig. S1. XRD patterns of $Na_{0.2}RuO_2$.

**Fig. S2.** TEM image and EDX analysis of (a) RuO₂ NS and (b) RuO₂ NP.

**Fig. S3.** (a) N_2 adsorption-desorption isotherms and (b) pore size distribution of RuO_2 NP and RuO_2 NS.

Fig. S4. (a) 4-CP degradation and (b) TOC removal in the presence of PMS and/or RuO_2 NS ($[cat.]_0 = 0.125$ g/L; $[4\text{-}CP]_0 = 100$ μM; $[PMS]_0 = 1$ mM; [Phosphate buffer]$_0 = 10$ mM; $pH_i = 7.0$).

Fig. S5. 4-CP degradation in RuO_2 NS/PMS system in buffered and unbuffered solution ([cat.]$_0$ = 0.125 g/L; [4-CP]$_0$ = 100 µM; [PMS]$_0$ = 1 mM; [Phosphate buffer]$_0$ = 10 mM (for buffered solution); pH_i = 7.0).
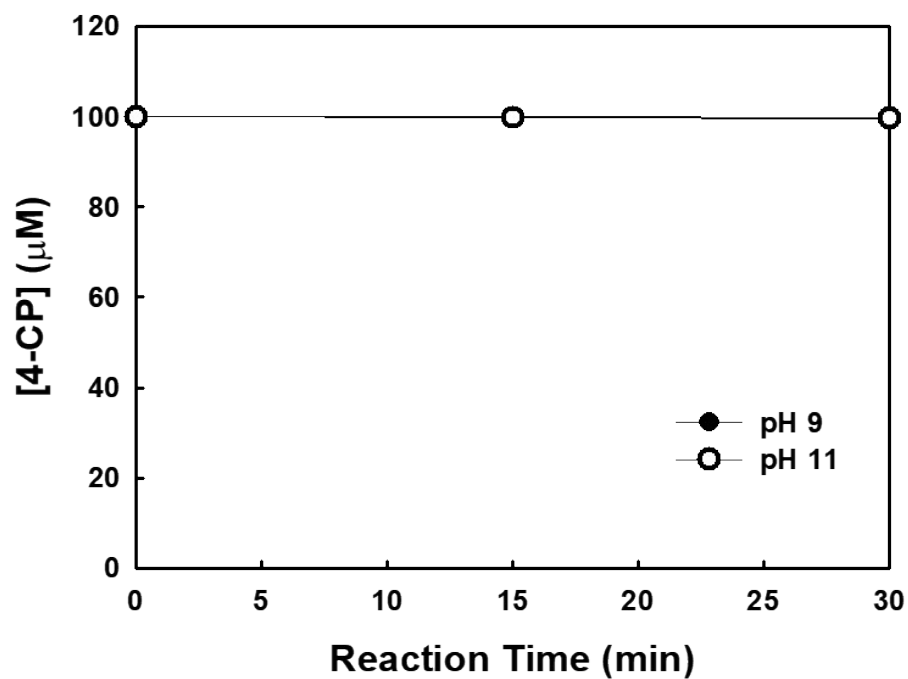
Fig. S6. 4-CP degradation in the absence of RuO_2 NS ($[4\text{-}CP]_0 = 100$ µM; $[PMS]_0 = 1$ mM; $pH_i = 9.0$ and 11.0).
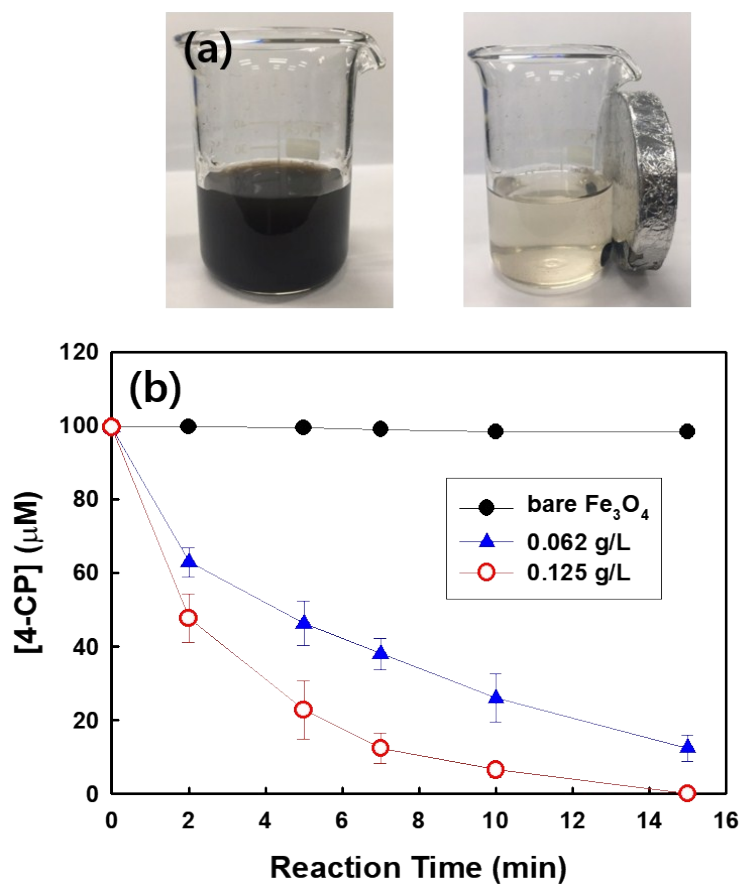
Fig. S7. (a) Photo images of aqueous dispersion of RuO_2 NS/Fe_3O_4 (left) and the recovery of catalysts using a magnet (right). (b) 4-CP degradation by RuO_2 NS/Fe_3O_4. ([4-CP]$_0$ = 100 µM; [PMS]$_0$ = 1 mM; [Phosphate buffer]$_0$ = 10 mM; pH$_i$ = 7.0).