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Supporting Information

**In situ decomposition of bromine-substituted catechol to increase the activity of titanium dioxide catalyst for visible-light-induced aerobic conversion of toluene to benzaldehyde**

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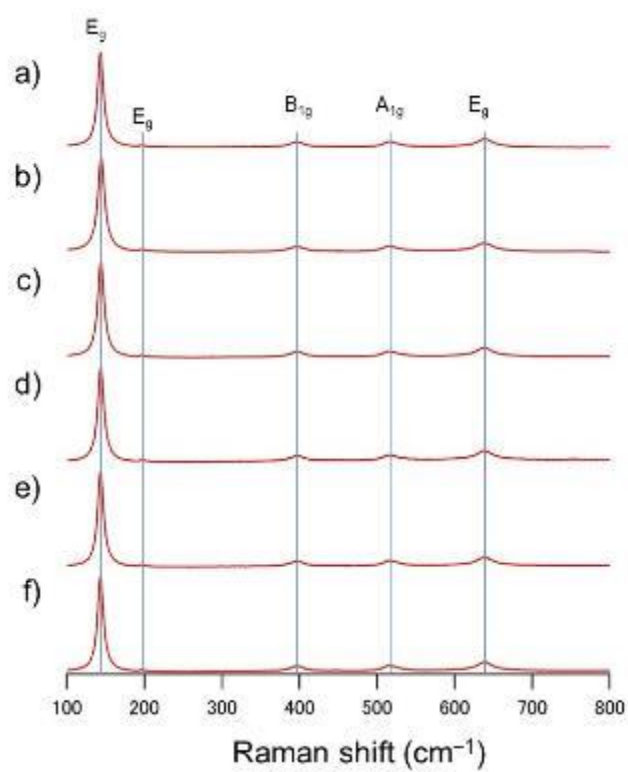
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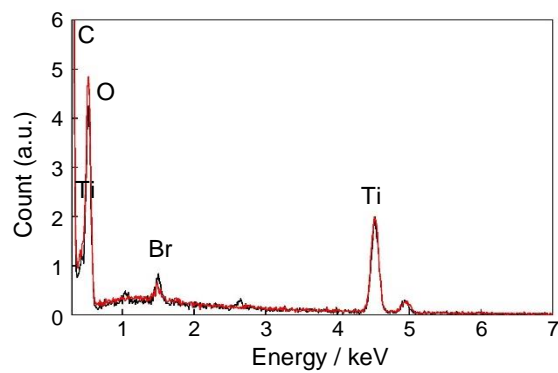
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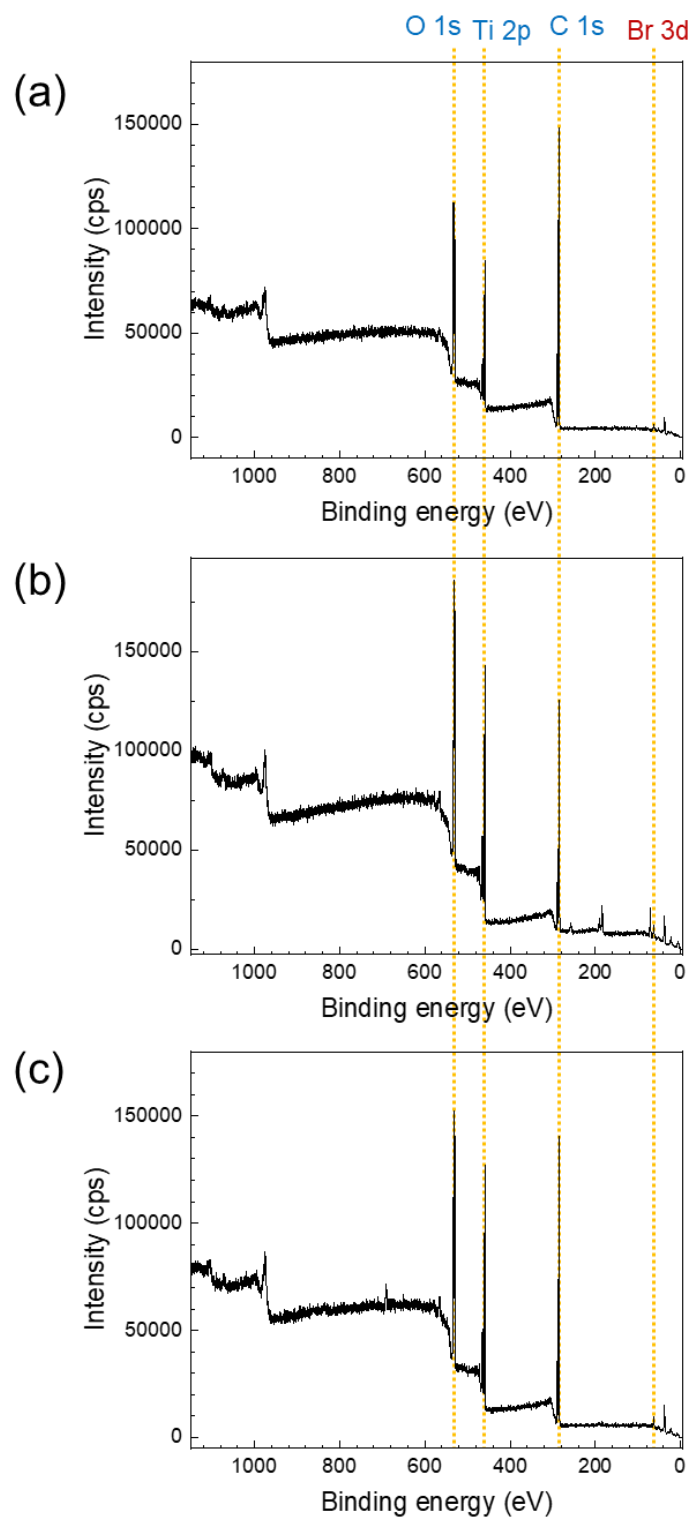
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**Fig. S1.** Raman spectra of (a) bare  $\text{TiO}_2$ , (b)  $\text{Br}_4\text{Cat-TiO}_2\text{-TiO}_2$ , and the  $\text{TiO}_2$  powder obtained after (c) 1, (d) 3, (e) 7, and (f) 15 hours of the reaction using  $\text{Br}_4\text{Cat-TiO}_2$ .



**Fig. S2.** EDS spectra of  $\text{Br}_4\text{Cat-TiO}_2$  (black line) and re- $\text{TiO}_2$  (red line).



**Fig. S3.** XPS spectra of bare TiO<sub>2</sub> (a), Br<sub>4</sub>Cat-TiO<sub>2</sub> (b), and re-Br<sub>4</sub>Cat-TiO<sub>2</sub> (c). Bare TiO<sub>2</sub> was measured after the same treatment as Br<sub>4</sub>Cat-TiO<sub>2</sub> using acetone instead of an acetone solution of Br<sub>4</sub>Cat.