

# Microwave-assisted Hydrothermal Synthesis of Perovskite $\text{NaTaO}_3$ Nanocrystals and its Photocatalytic Properties

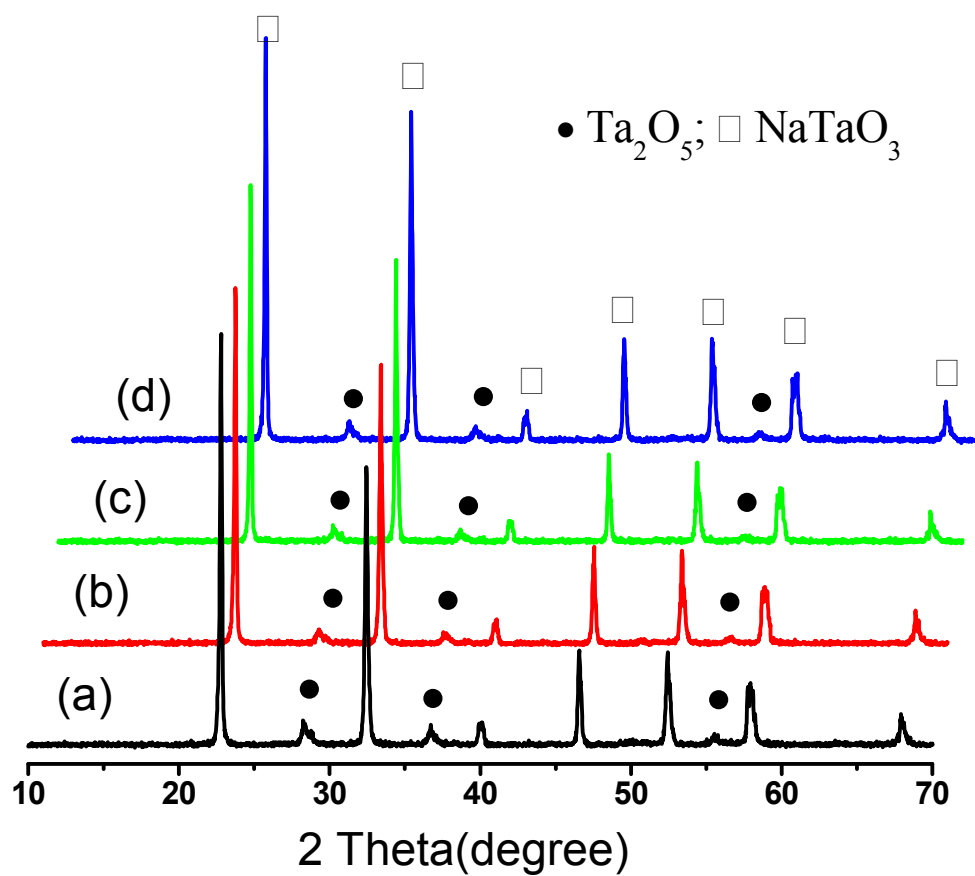
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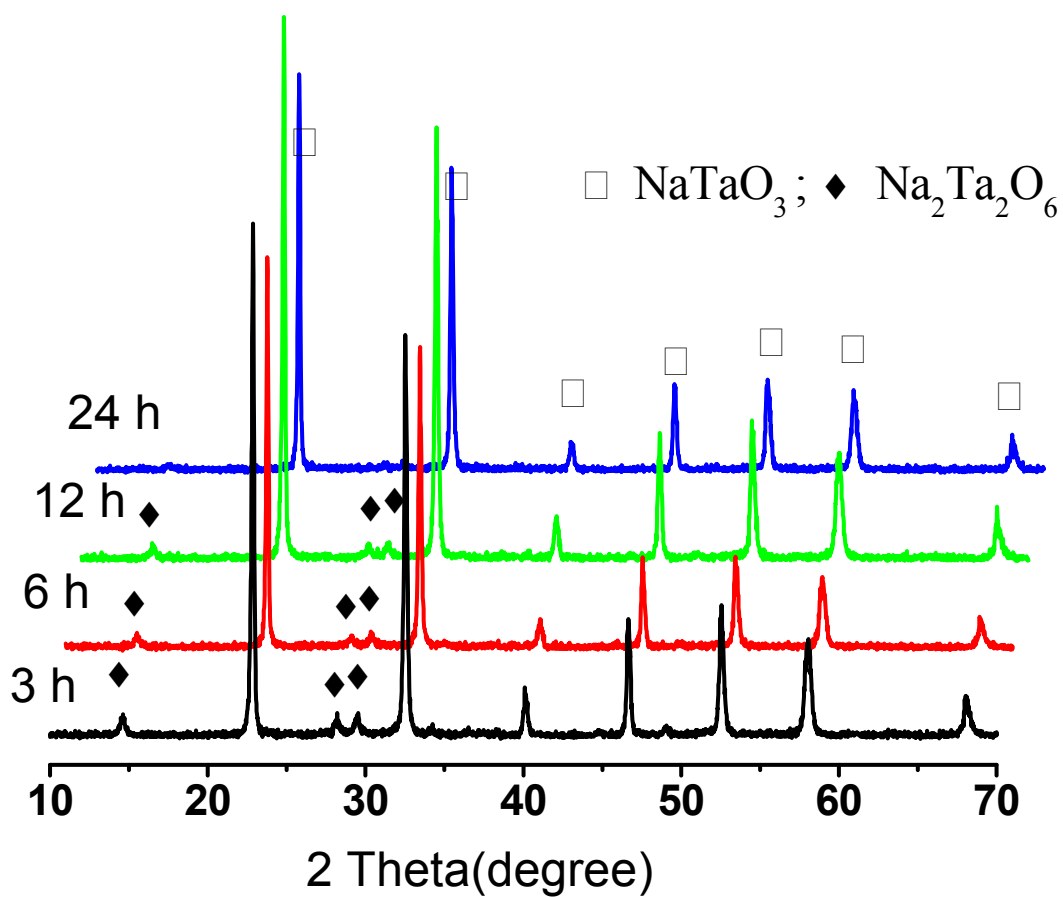
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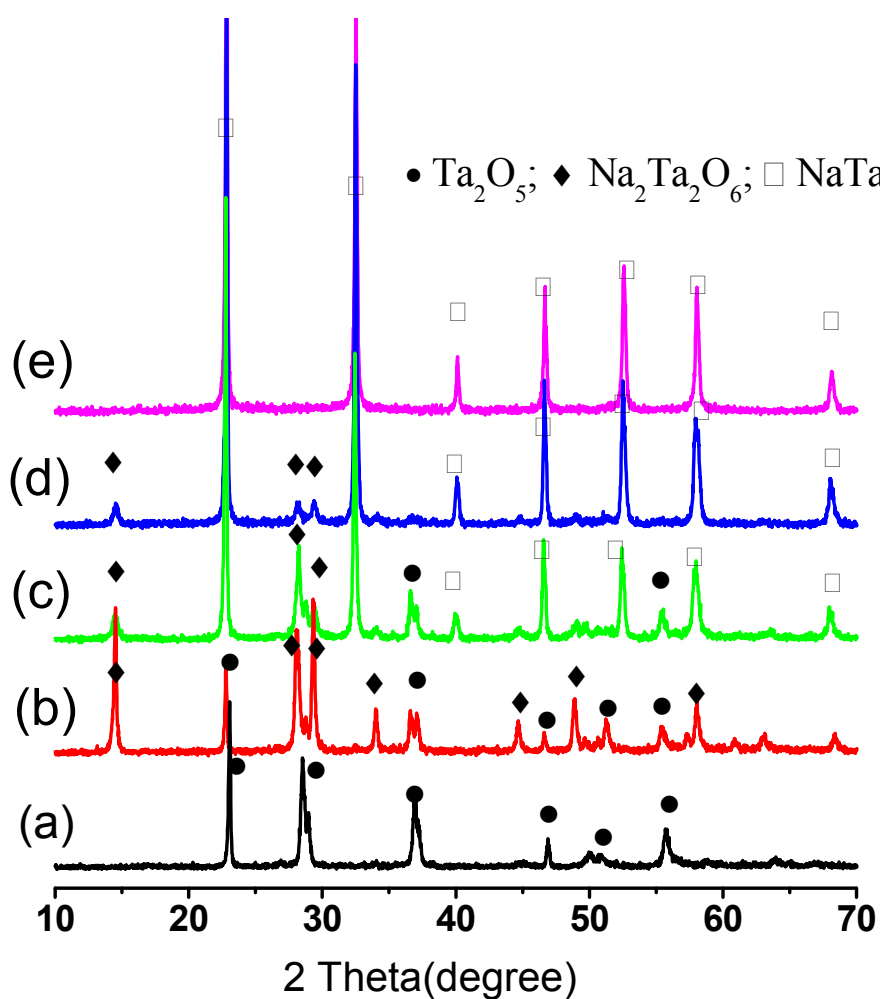
## Supporting Information



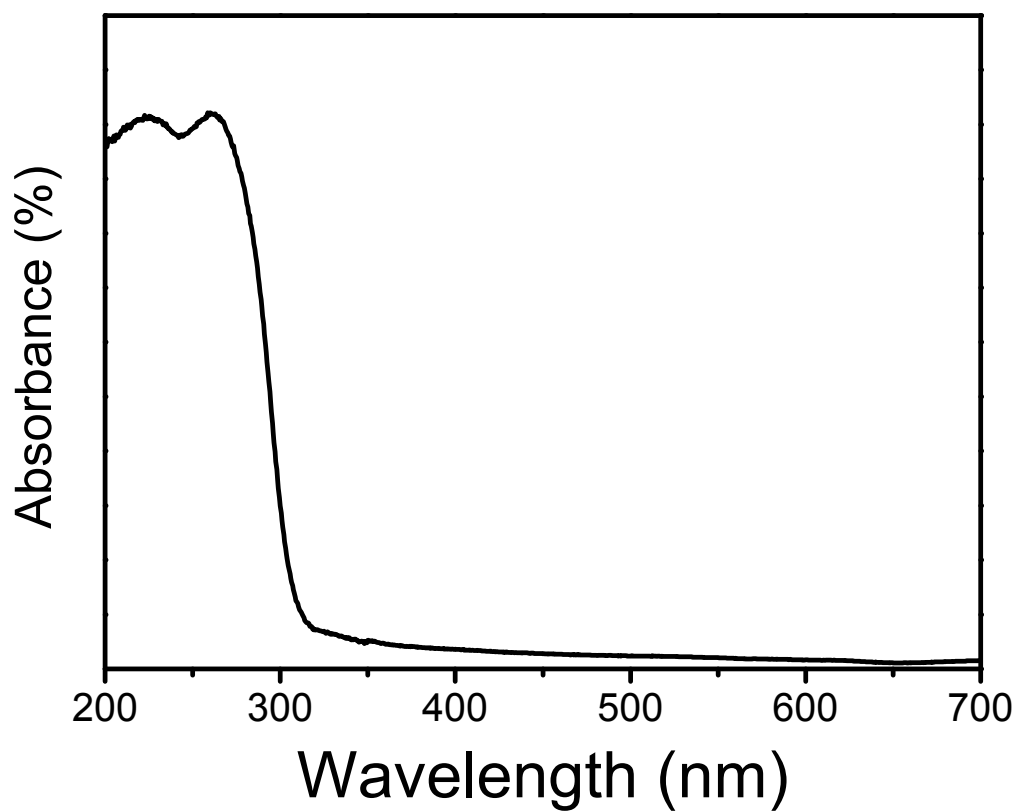
**Fig. S1** XRD patterns of the as-prepared samples derived at 160 °C in 1.75 M NaOH solution for (a) 6 h by MHT technique, (b) 12 h, (c) 18 h, and (d) 24 h by CHT method.



**Fig. S2** XRD patterns of the as-prepared samples derived at 160 °C in 1.75 M NaOH solution for different reaction times with 6-hour-ball milled Ta<sub>2</sub>O<sub>5</sub> as starting material in the CHT process.



**Fig. S3** Phase evolution from (a) to (e) detected by XRD analysis during the MHT reaction: (a)  $\text{Ta}_2\text{O}_5$  raw material, (b) mixed phases of  $\text{Ta}_2\text{O}_5$  and  $\text{Na}_2\text{Ta}_2\text{O}_6$  obtained in 0.2 M NaOH solution after 3 h, (c) mixed phases of  $\text{Ta}_2\text{O}_5$ ,  $\text{Na}_2\text{Ta}_2\text{O}_6$  and  $\text{NaTaO}_3$  obtained in 1.0 M NaOH solution after 5 minutes with 12-hour-ball milled  $\text{Ta}_2\text{O}_5$  as raw material, (d) mixed phases of  $\text{Na}_2\text{Ta}_2\text{O}_6$  and  $\text{NaTaO}_3$  obtained in 0.5 M NaOH solution, and (e) pure  $\text{NaTaO}_3$  phase obtained in 1.75 M NaOH solution after 3 h with 6-hour-ball milled  $\text{Ta}_2\text{O}_5$  as raw material at 160 °C.



**Fig. S4** Representative UV-Vis diffuse reflectance spectroscopy of as-prepared sample with pure NaTaO<sub>3</sub> phase. The sample was obtained in 1.75 M NaOH solution at 160 °C with 6-hour-milled Ta<sub>2</sub>O<sub>5</sub> as precursor under MHT conditions for 3 h.