

Electronic Supplementary Information for

**LaTiO<sub>2</sub>N nanopowders (NPs) with low surface defect density via nitridation of flame made NPs retaining simple perovskite structure.**

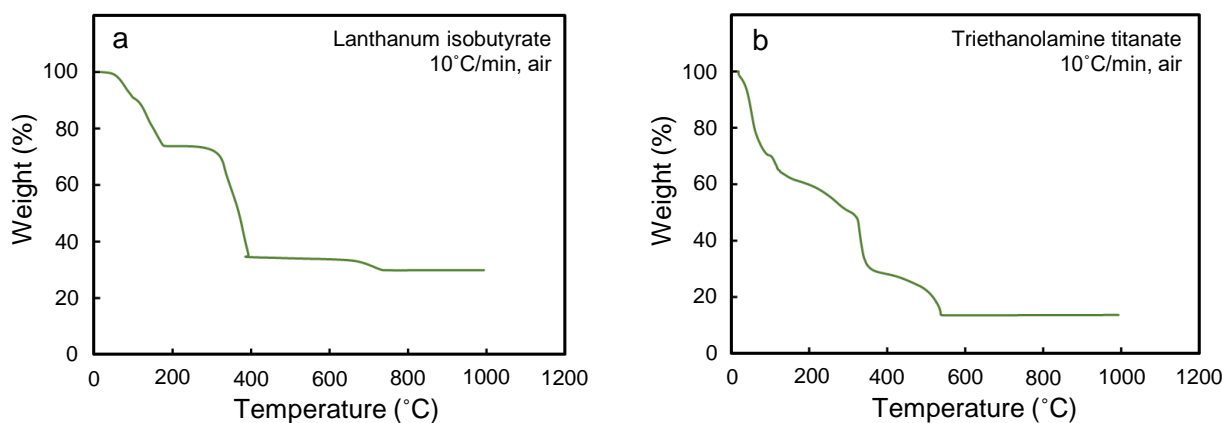
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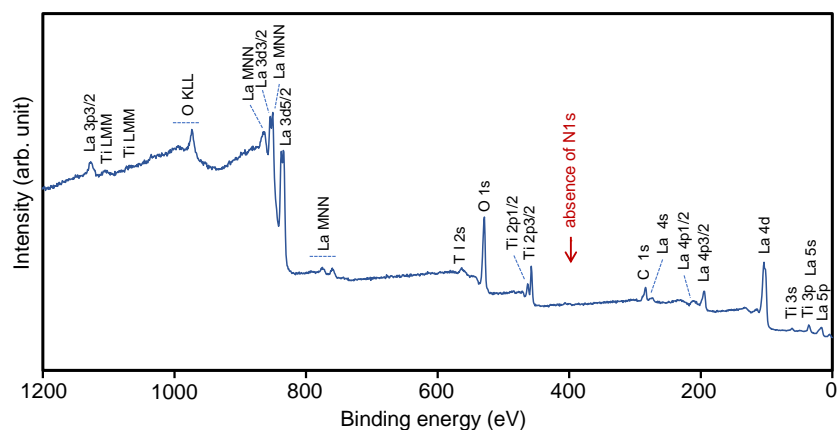
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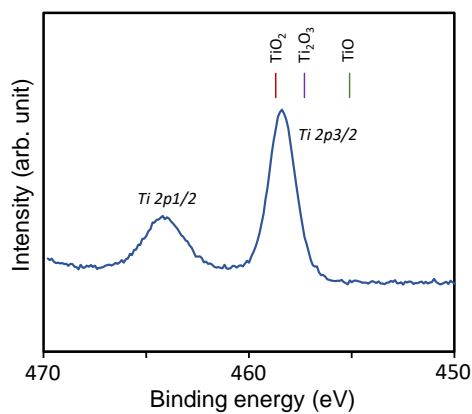
This electronic supplementary information contains TG analysis of lanthanum isobutyrate and triethanolamine titanate, XPS analysis of LTO-4/3 NP, XRD patterns for the heat-treated oxynitride powders at 1300 °C/0h/79N<sub>2</sub>-21O<sub>2</sub>, additional TEM images of LTO-1 NP and LTO-4/3 NP after nitridation at 1050 °C/15 h/NH<sub>3</sub>, and Williamson-Hall plot of SXRD peaks for cubic LaTiO<sub>3</sub> in LTO-4/3 NP.



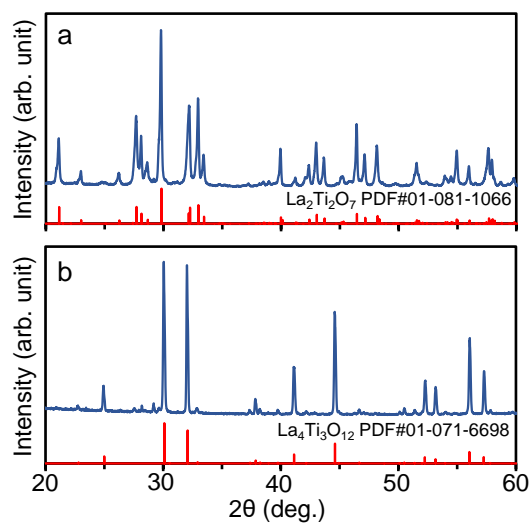
**Figure S1.** TG analysis for (a) lanthanum isobutyrate and (b) triethanolamine titanate at heating rate of 10 °C/min in air.



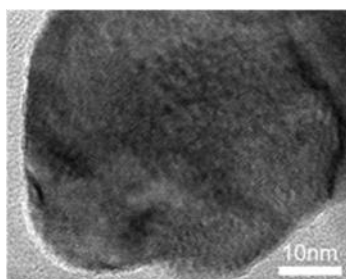
**Figure S2.** XPS wide-scan spectrum of LTO-4/3 NP.



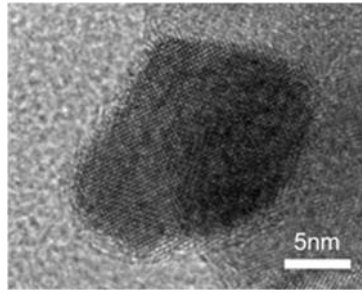
**Figure S3.** Ti2p XPS spectrum of LTO-4/3 NP.



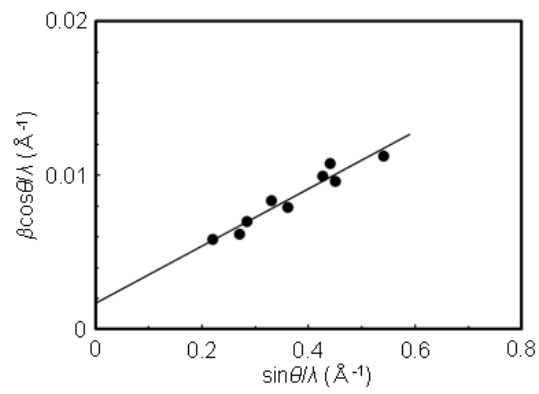
**Figure S4.** XRD patterns ( $\text{CuK}\alpha_1$ ) for the heat-treated oxynitride powders at  $1300^\circ\text{C}/0\text{h}/79\text{N}_2\text{-}21\text{O}_2$ . Heating rate:  $10^\circ\text{C}/\text{min}$ . Oxynitride powders: (a) LTO-1 nitrided at  $1050^\circ\text{C}/15\text{h}/\text{NH}_3$ , (b) LTO-4/3 nitrided at  $1050^\circ\text{C}/15\text{h}/\text{NH}_3$ .



**Figure S5.** TEM image of LTO-1 NP after nitridation at  $1050^\circ\text{C}/15\text{h}/\text{NH}_3$ .



**Figure S6.** TEM image of LTO-4/3 NP after nitridation at 1050 °C/15 h/NH<sub>3</sub>.



**Figure S7.** Williamson-Hall plot of SXRD peaks for cubic LaTiO<sub>3</sub> in LTO-4/3 NP before nitridation.