

## Submicron Size of Alumina/Titania Tubes for CO<sub>2</sub>-CH<sub>4</sub> Conversion

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**Abstract :** This research provides a systematic way to study and better understand double nano-tubular structure of alumina (Al<sub>2</sub>O<sub>3</sub>) and titania (TiO<sub>2</sub>). The TiO<sub>2</sub> NT was prepared by immersing Al<sub>2</sub>O<sub>3</sub> template in 0.02 M titanium fluoride (TiF<sub>4</sub>) solution (pH=3) at 25 °C for 120 min, followed by annealing at 450 °C for 1 h to obtain anatase TiO<sub>2</sub> NT in the Al<sub>2</sub>O<sub>3</sub> template. Large-scale development of film for nanotube-based CO<sub>2</sub> capture and conversion can potentially result in more efficient energy harvesting. In addition, the production process will be relatively environmentally friendly. The knowledge generated by this research will significantly advance research in the area of Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, CaO, and Ca<sub>2</sub>O<sub>3</sub> nano-structure film fabrication and applications for CO<sub>2</sub> capture and conversion. This green energy source will potentially reduce reliance on carbon-based energy resources and increase interest in science and engineering careers.

**Keywords :** alumina, titania, nano-tubular, film, CO<sub>2</sub>

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