

Vanadium Oxide 나노구조 형성 Anodic Growth of Vanadium Oxide Nanostructures

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초 록: Nanoporous or nanotubular metal oxide can be fabricated by anodization of metal substrate in fluoride contained electrolytes. The approach allows various transition metals such as Zr, Hf, Nb, Ta to form highly ordered oxide nanostructures. These oxide nanostructures have various advantages such as high surface area, fast electron transport rate and slow recombination in semiconductive materials.

Recently, vanadium oxide nanostructures have been drawn attentions due to their superior electronic, catalytic and ion insertion properties. However, anodization of vanadium metal to form oxide layers is relatively difficult due to ease formation of highly soluble complex in water contained electrolyte during anodization. Yang et al. reported $[\text{TiF}_6]^{2-}$ or $[\text{BF}_4]^-$ in electrolyte helps to formation of stable oxide layer [1, 2]. However, the reported approaches are very sensitive in other parameters.

In this presentation, we deal with the other important key parameters to form ordered anodic vanadium oxide such as pH, temperatures and applied potential.

References

- [1] Y. Yang, S. P. Albu, D. Kim, and P. Schmiki, *Angew. Chem. Int. Ed.*, 50 (2011) 9071-9075
- [2] Y. Yang, K. Lee, M. Zobel, M. Mackovic, T. Unruh, E. Spiecker, and P. Schmuki, *Adv. Mater.*, 24 (2012) 1571-1575