

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

In this study, titania nanotubes (TNTs) were successfully synthesized by microwave method. At the optimum conditions of 150 °C reaction temperature and 90 min reaction time mostly tubular structure, having 5 nm and 9-12 nm of inner and outer diameters, respectively, was produced. The length of the nanotubes varied from 80 nm to hundreds of nanometres. The acid shaking process made all Na⁺ ions in the nanotubes out of the tubes by exchanging with H⁺ ions, resulting in higher surface area (313.6 m²/g) than unshaking sample (175.6 m²/g). However, as synthesized TNTs itself exhibited no photocatalytic activity on 4-nitrophenol.

Recommendations

1. Effect of washing process on the nanotube formation should be further investigated.
2. Other characterization techniques should be used to investigate the structure and thermal stability of the titania nanotubes, such as Raman, DSC and TGA. (Ribbens *et al*, 2008; Sun *et al*, 2003).
3. To improve photocatalytic activity of titania nanotubes, other active metals should be studied.