

## Synthesis and characterization of ZnO nanostructures using palm olein as biotemplate

### ABSTRACT

**Background** A green approach to synthesize nanomaterials using biotemplates has been subjected to intense research due to several advantages. Palm olein as a biotemplate offers the benefits of eco-friendliness, low-cost and scale-up for large scale production. Therefore, the effect of palm olein on morphology and surface properties of ZnO nanostructures were investigated. **Results** The results indicate that palm olein as a biotemplate can be used to modify the shape and size of ZnO particles synthesized by hydrothermal method. Different morphology including flake-, flower- and three dimensional star-like structures were obtained. FTIR study indicated the reaction between carboxyl group of palm olein and zinc species had taken place. Specific surface area enhanced while no considerable change were observed in optical properties. **Conclusion** Phase-pure ZnO particles were successfully synthesized using palm olein as soft biotemplating agent by hydrothermal method. The physico-chemical properties of the resulting ZnO particles can be tuned using the ratio of palm olein to Zn cation.

**Keyword:** Biotemplate; Hydrothermal synthesis; Palm oil; Palm olein; Soft templating; Zinc oxide nanostructures; ZnO.