

## Controlled synthesis of cobalt ferrite magnetic nanoparticles for hyperthermia-based treatments

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The magnetic cobalt ferrite ( $\text{CoFe}_2\text{O}_4$ ) nanoparticles have attracted considerable attention in biomedical applications because of their specific magnetic properties. The  $\text{CoFe}_2\text{O}_4$  nanoparticles were synthesized by solvothermal method using oleic acid as a surfactant. The morphology of  $\text{CoFe}_2\text{O}_4$  nanoparticles could be controlled by adjusting the oleic acid concentration. The oleic acid-coated  $\text{CoFe}_2\text{O}_4$  nanoparticles are well dispersible in non-polar organic media and not stable in aqueous phase. Therefore, we tried to prepare hydrophilic nanoparticles by coating their surface with citric acid for biomedical applications. We investigated the potential of citric acid-coated (CA- $\text{CoFe}_2\text{O}_4$ ) nanoparticles in hyperthermia treatment by magnetic heating instrument using an alternating magnetic field. The specific absorption rate (SAR) of  $\text{CoFe}_2\text{O}_4$  nanoparticles was calculated based on experimental studies. Our results showed that the higher magnetic field strength resulted in faster heating rate. Usually, the smaller  $\text{CoFe}_2\text{O}_4$  nanoparticles have the higher value of SAR and also higher hyperthermia efficiency in this study.