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# Mössbauer analysis and induction heating evaluation of grapes like FZ@MWCNT towards cancer treatment

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#### Abstract

We have successfully modified the synthesis of  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> and ZnO in a variety of potential matrices, like as multiwall carbon nanotubes (MWCNT) and <u>graphene oxide</u> (GO), referred to as FZ@MWCNT and FZ@MWCNT-GO. X-ray diffraction (XRD) and scanning electron microscopy (SEM) were performed for phase formation and morphological analysis. Phase purity and superparamagnetic environment of maghemite and FZ@MWCNT were investigated by <sup>57</sup>Fe Mössbauer spectrometry at 77 and 300K, confirming the reduction of dipolar interaction. Induction heating of  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub>, FZ@MWCNT and FZ@MWCNT-GO was analysed at various concentrations of <u>nanoparticles</u> to investigate the suitability of this nanocomposite for hyperthermia application. Ironically, the inductive heating rate of FZ@MWCNT at 3mg/ml concentration is reflecting its high potential for hyperthermia therapy in cancer treatment.

### Graphical abstract



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