

RINGKASAN

Telah dilakukan penelitian tentang *Green Synthesis* nanopartikel Fe_3O_4 berbasis pasir besi sungai Batanghari Jambi dengan sampel Fe_3O_4 dan penambahan konsentrasi ekstrak daun suji dengan variasi 33,3%, 66,7% dan 100% menggunakan metode *Green Synthesis* yang bersifat lebih ramah lingkungan. Tujuan penelitian ini yaitu untuk mengetahui pengaruh variasi konsentrasi ekstrak daun suji (*Pleomele Angustifolia*) pada hasil karakterisasi ukuran kristal pada XRD, morfologi SEM dan gugus fungsi pada FTIR. Karakterisasi XRD menunjukkan hkl (311) yang menjadi karakteristik Fe_3O_4 dengan sudut 2θ secara berturut-turut pada keempat sampel $35,49^\circ$, $35,58^\circ$, $35,57^\circ$ dan $35,24^\circ$. Dari hasil XRD diperoleh bahwa penambahan ekstrak tidak membawa pengaruh yang begitu signifikan pada ukuran kristal. Selain itu dengan penambahan konsentrasi ekstrak 33,3% terjadi peningkatan fasa magnetit. Hasil ini menunjukkan bahwa penambahan ekstrak daun suji yang tepat mampu melindungi Fe_3O_4 selama proses sintesis agar tidak berubah dalam wujud fasa lain. Karakterisasi SEM menunjukkan morfologi sampel dengan ukuran yang tidak homogen, dikarenakan sifat nanopartikel Fe_3O_4 yang mudah teroksidasi dan teraglomerasi. Berdasarkan distribusi partikel rata-rata partikel masing-masing sampel Fe_3O_4 ; $\text{Fe}_3\text{O}_4 + 33,3\%$ *Pleomele Angustifolia* dan $\text{Fe}_3\text{O}_4 + 100\%$ *Pleomele Angustifolia* secara berturut-turut sebesar 53.20 nm, 54.63 nm dan 75 nm. Dari data FTIR dapat dilihat munculnya pita serapan gugus fungsi Fe-O dikeempat sampel diarea pita serapan $528,96 \text{ cm}^{-1} - 535,81 \text{ cm}^{-1}$, hal ini membuktikan dengan penambahan konsentrasi ekstrak daun suji Fe_3O_4 berhasil terbentuk.

SUMMARY

Research has been conducted on Green Synthesis of Fe_3O_4 nanoparticles based on Batanghari river iron sand Jambi with Fe_3O_4 samples and the addition of suji leaf extract concentrations with variations of 33.3%, 66.7% and 100% using the Green Synthesis method which is more environmentally friendly. The purpose of this study was to determine the effect of variations in the concentration of suji leaf extract (*Pleomele Angustifolia*) on the results of crystal size characterisation in XRD, SEM morphology and FTIR. XRD characterisation showed hkl (311) which is characteristic of Fe_3O_4 with 2θ angles successively in the four samples 35.49° , 35.58° , 35.57° and 35.24° . From the XRD results, it was found that the addition of the extract did not have a significant effect on the crystal size. In addition, with the addition of 33.3% extract concentration, there was an increase in the magnetite phase. This result shows that the addition of the right suji leaf extract is able to protect Fe_3O_4 during the synthesis process so that it does not change in the form of other phases. SEM characterisation shows the morphology of samples with inhomogeneous size, due to the nature of Fe_3O_4 nanoparticles that are easily oxidised and agglomerated. Based on particle distribution, the average particle size of each sample Fe_3O_4 ; $\text{Fe}_3\text{O}_4 + 33.3\%$ *Pleomele Angustifolia* and $\text{Fe}_3\text{O}_4 + 100\%$ *Pleomele Angustifolia* were 53.20 nm, 54.63 nm and 75 nm respectively. From the FTIR data, it can be seen the appearance of the Fe-O functional group absorption band in the four samples in the 528.96 cm^{-1} - 535.81 cm^{-1} absorption band area, this proves that with the addition of suji leaf extract concentration Fe_3O_4 was successfully formed.