

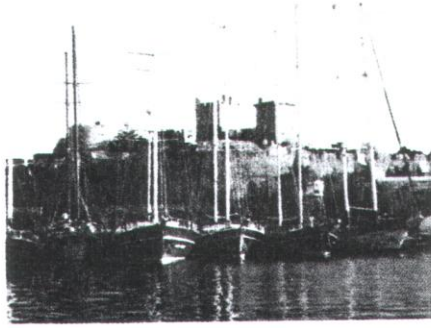


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## ÖZET KİTABI

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T.T.

## **SUPERPARAMAGNETIC NATURE OF THE OLEIC ACID ADSORBED IRON OXIDE NANOPARTICLES IN POWDER AND DISPERSED STATE**

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Iron oxide nanoparticles were synthesized by thermal decomposition of iron oleate in the presence of oleic acid as a surfactant. X-ray diffraction (XRD) patterns showed the characteristic peaks of iron oxide. The crystal size calculated from the XRD data is 10.9 nm. Fourier transform infrared spectroscopy (FT-IR) indicates that oleic acid molecule on the nanoparticle is adsorbed. The magnetic properties were studied in the powder and solution states (chloroform) at room temperature using vibrating sample magnetometer, respectively. Hysteresis curves suggested the superparamagnetic nature of the particles but the coercivity in the powder state was 3.11 Oe. This case may be explained that magnetic interactions between the particles should exist since the coated oleic acid molecules on the particle surface may flocculate the nanoparticles. It is seen that the coercivity of the particles dispersed in the chloroform decreased to 0.13 Oe as the isolation of the particles have been increased in a liquid phase and hence reduced the interactions between the particles in the solution.

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