

## UV SPECTROSCOPIC STUDIES ON FERRIC-NITRILOTRIACETIC ACID CHELATES AND THEIR PEROXIDATIVE CATALYTIC ACTIVITY TO METHYLLINOLEATE

MOHAMMED EHSANUL HOQUE MAZUMDER<sup>1</sup>, MD. RAFIQUZZAMAN<sup>1, 2</sup>  
AND S. SHABBIR HAIDER<sup>1, 3</sup>

<sup>1</sup>Department of Pharmacy, Jahangirnagar University, Savar, Dhaka-1342, Bangladesh.

<sup>2</sup>School of Health Science, Universiti Sains Malaysia, Health Campus,  
16150 Kubang Kerian, Kelantan, Malaysia.

<sup>3</sup>Department of Pharmacy, University of Dhaka, Dhaka-1000, Bangladesh.

UV absorption spectra of  $\text{FeCl}_3$  and nitrilotriacetic acid (NTA) mixtures at various molar ratios in 98% methanol were recorded and analyzed. The UV absorption spectra of  $\text{FeCl}_3$  and NTA mixtures changed greatly depending on the molar ratio of  $\text{FeCl}_3$  to NTA in 98% methanol. Two types of ferric-NTA chelates were detected spectrophotometrically and those have absorption maximum at 255 nm and 245 nm. The absorption maximum at 255 nm was assigned to 1 to 1 metal to ligand composition, i.e.  $\text{Fe(III)-NTA}$  chelate, which was formed at 1:1 to 1:4 molar concentration ratios of ferric to NTA. The absorption maximum at 245 nm was assigned to 1 to 2 metal to ligand composition, i.e.  $\text{Fe(III)(NTA)}_2$  chelate, which was formed at 1:6 to 1:10 molar concentration ratios of ferric to NTA. Methylloleate (ML), a model of lipid, was employed to undergo peroxidation under the influence of ferric-NTA chelates. Both the chelates were found to induce peroxidation to methylloleate. Thiobarbituric acid reactive substance (TBARS) assay and  $A_{232\text{ nm}}$  absorption assay for peroxidation study of methylloleate produced parallel results to conclude the relative peroxidative catalytic activity of the ferric-NTA chelates. The  $\text{Fe(III)(NTA)}_2$  chelate showed two times more peroxidative catalytic activity than that of the  $\text{Fe(III)-NTA}$  chelate towards the peroxidation of methylloleate.

**Keywords:** Lipid peroxidation, Ferric-NTA chelate, Spectrum, Methylloleate, and Catalytic activity.