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Citric Acid: A Promising Copper Scavenger

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Citric Acid: A Promising Copper ScavengerAna Martínez^{1*}, Rubicelia Vargas² and Annia Galano²

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Abstract

In this investigation, the capacity of citric acid as copper scavenger is analyzed. For the copper scavenger capacity, the formation of the chelate complexes is studied using the Gibbs free energies. The chelates may be formed since the formation reactions are all exergonic. The free radical scavenger ability of chelate complexes is investigated using the single electron transfer mechanism with the Full Electron Donor-Acceptor Map (FEDAM). Different acid-base species of citric acid are also studied as •OH inactivating ligands (OIL). The conclusion of this investigation is that metal chelation is viable for citric acid species and also that the formed chelates are efficient •OH scavengers. Therefore, it is possible to conclude that citric acid is promising for copper chelation therapy (metal scavenger). These results may be useful for further investigations concerning citric acid and can give ideas about the benefits of citric acid as an additive in food.

Keywords: antioxidant; DAM; density functional theory; oxidative stress

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