

Synthesis and Characterization of Some Selenium Nanometric Compounds: Spectroscopic, Biological and Antioxidant Assessments

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Abstract

Selenium (IV) vitamin A complex as antioxidant drug design was prepared and characterized by microanalysis, conductance, infrared spectra, Raman laser spectra, ¹HNMR spectra, scanning electron

microscopy (SEM), X-ray powder diffraction (XRD) and thermogravimetric (TG/DTG and DTA)

tool of analyses. Vitamin A chelate was coordinated as a mono-dentate ligand through the oxygen atom of –OH hydroxyl group. Thermal degradation analyses discussed the removal of terminal methyl molecules in the first and second decomposition stage while the organic ligand moieties existed in the third and subsequence steps. The Se (IV) complex in comparable with free vitamin A

ligand has been assessed against some kinds of bacteria and fungi which gave a significant inhibition.

The surface morphology and nano scale size of selenium metal and its vitamin complex were proved. The activation energy and other thermodynamic parameters (ΔH^* , ΔS^* and ΔG^*) of Se (IV)

complex were calculated using Coats-Redfern and Horowitz-Metzger equations.

Keywords

Vitamin A, Selenium, Nano-Scale, Spectroscopic, Thermal Analysis, Antimicrobial Activity