

Sudan University of Science and Technology
College of Graduate Studies

**Determination of Trace Elements in Human Hair and
Nails as a measure of the Nutritional Imbalance in
Kassala State, Using XRF Spectroscopy**

تحديد اثر العناصر المعدنية في الشعر و الأظافر لقياس التوازن الغذائي
لسكان ولاية كسلا باستخدام مطيافية الأشعة السينية المتفلورة

Submitted by:

Suleiman Awad Hamouda Belal

(B.Sc, Honor, PGD, M.Sc in Physics)

A Thesis Submitted in Fulfillment for the Degree of Doctor of
Philosophy in

Physics

Supervisor:

Prof .Dr: Ali El-Tahir Sharaf El-Din

Co supervisor:

Prof. Dr: Mubarak Dirar Aballa

June, 2015