



Name of Candidate: Ahmed Abdel-latif Mohamed Abdel-latif

Degree: PhD.

Title of Thesis: "PRACTICAL INVESTIGATIONS OF DEVELOPED MATERIALS FOR NUCLEAR APPLICATIONS"

Supervisors:

1- Prof. Dr. Samir YoushaElkhamisy 2- Prof. Dr. Mamdouh Mahmoud Eissa

3- A. Prof. Ashraf Hamed Gad 4- Dr. Maged Mahmoud Kassab

Department: Mathematics and Engineering Physics **Approval:** 9/6/2014

ABSTRACT

Mass attenuation coefficients, half value layers, Mean free paths, total atomic cross section, total electrical cross section and effective atomic numbers have been determined for the prepared samples at photon energy range from 238 to 2614 keV. The obtained results are compared with the corresponding theoretical calculation (based on WINXCOM program data Tables) of the mass attenuation properties, and a fair agreement is achieved.

In addition, the hardness, density and Microstructure of the prepared in house alloys have been determined for the investigated steels. High nitrogen free nickel stainless steel and carbon steel samples have been also investigated for the sake of comparison. The achieved results reveal the superiority of cobalt-free maraging steels comparing with the other investigated high nitrogen free nickel and carbon steels to be used as a proper shielding material in the nuclear domain.