



Electron Emission from Materials at Low Excitation Energies

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An experimental system has been designed and developed with the purpose of measuring the total electron emission yield from materials at low energy excitation. In the first instance the reliability of the system was checked by measuring the total electron emission yield for a well defined surface (aluminium 99.45%). The obtained data was in the expected range given by the literature, and consequently the system will be used further for measuring the total electron yield for a range of materials with interest in the instrumentation industry. We intend to measure the total electron emission yield under electron bombardment as a function of incident electron energy up to 1200 eV, angle of incidence, state of the surface and environment to which the surface has been exposed. Dependence of emission on total electron irradiated dose is also of interest. For many practical application of the "Secondary Electron Emission", the total electron yield is desired to be as large as possible. The above phenomenon has practical applicability in electron multiplier tube and Scanning electron microscopy - when by means of the variation of the yield of the emitted electrons one may produce visible images of small sample areas. The electron multiplier tube, is a device which utilises the above effect to detect and amplify both single particles and low currents streams of charged particles. The majority of electron tubes use electrons with low energy, hundreds of eV. Not a lot has been published in the literature about this regime and also about the emission when the impinging electrons have small energy, up to 1 KeV. The information obtained from the experimental measurements concerning the total electron emission yield is used to asses the investigated materials as a potential electron emitting surfaces or dynodes in an electron multiplier tube.