allied academies

International Conference on

Materials Science and Engineering

July 23-25, 2018 | Moscow, Russia

X-ray Fluorescence analysis at total reflection in conditions of planar waveguide resonators application

V K Egorov and **E V Egorov**
Institute of Microelectronics Technology and High Purity Materials RAS, Russia

One of the most task of material diagnostics is the element analysis of thin fluorescence analysis executed in conditions of total external reflection of X-ray exciting beam on the studied surface-TXRF analytical method is the best experimental technique for the task solution.. TXRF is characterized by very attractive detection limits owing to low magnitude of the background deposit and exemption from matrix effect. X-ray fluorescence yield intensity in the method is proportional to element concentration in the excited layer. It's thickness is nearly 3-5 nm. In the result, the critical parameter of TXRF spectrometry is the exciting beam radiation density. Modern X-ray nanophotonics has suitable device called planar X-ray waveguide-resonator (PXWR) , which can form X-ray nanosize beams with nanosize width and enhanced radiaiton density. In comparison with X-ray beams formed by slit-cut devices the PXWR is able to increase the radiation density in the beam on 3-4 orders. In the result, X-ray waveguide-resonance devices are used as the exciting beam for TXRF spectrometry allows to decrease contamination detection limits on 1.5-2 order in comparison with measurements executed by slit-cut systems application. Report discusses different TXRF measurement schemes built on base of X-ray beam waveguide-resonators with different design. It has shown the way for TXRF spectrometry development on base of these devices. There are presented TXRF experimental data obtained for the real solid objects and dry residues of different solutions.

Speaker Biography

Vladimir Egorov was born in Moscow in 1947 year. In 1971, he completed his graduation in Moscow Engineering and Physical Institute with the specialization of Material science. In 1981 he defended a doctoral thesis in the specialization of Solid state physics. Currently, he is working as a senior scientist in laboratory of X-ray crystallo-optics of Institute of Microelectronics Problems of Russian Academy of Science.He is an expert in ion beam analysis of material, X-ray study of materials and in specific field of X-ray nanophotonics based on waveguide-resonance propagation phenomenon.

e: egorov-iptm@mail.ru

Notes: