



Contribution ID: 147

Type: **Wedge Participant**

Optimization of SEM and EDX measurements for swipes and samples containing uranium by MATLAB

Micro-analysis of particles and swipes, as safeguards tool is routinely used by the International Atomic Energy Agency (IAEA) to verify the absence of undeclared nuclear activities in states subject to comprehensive safeguards. This can be achieved by Scanning Electron Microscope (SEM) combined with Energy Dispersive X-ray (EDX). Uranyl nitrate hexahydrate sample from safeguards destructive assay chemistry lab and swipes from the glove box used for handling uranium samples were used in this study. Various SEM images can be analyzed with the help of computer image analysis software. Image processing is used to describe the size, shape, surface morphology of micro or nano structure materials. Digital image processing remains a challenging domain of programming for several reasons. This work deals with the use of image processing to enhance images contrast, analyze it and developing a model for size estimation in micro-scale using MATLAB functions with the aid of smile view software compatible with SEMEDX; of JSM 6510 LV model. The developed method overcomes problems that face smile view software it can be used to measure the length between two points in micro-scale depending on only magnification value information in contrary to smile view it can be also used to measure the area of analysis in any image type easily with excellent precision and accuracy. This model uses available software and does not need any specialized, complicated or expensive softwares. we can apply it to any sample image especially in case of swipes that contain very small particles of high brightness at higher magnifications in which the eye facing difficulties to determine its border, also these particles can be enhanced using matlab as mentioned above and noise can be removed. The final aim of this paper is to spot light on the role of mapping in showing the distribution of any element located in the sample. EDX is used to analyze nuclear materials and swipes, makes structure elucidation of it also x-ray dotted maps of each element is made to study its distribution and this can give as a valuable information concerning sample homogeneity.

Which "Key Question" does your Abstract address?

TEC1.1

Topics

TEC1

Which alternative "Key Question" does your Abstract address? (if any)

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Session Classification: [SGI] Enhancements and Innovation in Sample Collection and Analysis

Track Classification: Shaping the future of safeguards implementation (SGI)