

Quantitative image analysis on silver nanowires and zeolite membrane

_____, _____, _____
(jaewooknam@skku.edu*)

Image analysis has become increasingly important in many engineering fields. Especially in the a field of materials processing for fabrication and production of multi-functional films, such as transparent conductive film and molecular sieve separation membrane, the performance can be characterized, e.g. detecting defects, by analysing optically magnified images or even higher magnified images from using electron microscope, i.e. scanning electron or transmission electron microscopy (SEM or TEM). Here, we show you the two topics. The first, we propose a simple yet reliable image segmentation method which is the first step in quantifying microscopic features by extracting materials from background or void based on information entropy. Second, we show you analysing images from microscope: silver nanowires and zeolite membranes. For silver nanowires, we estimate optoelectric properties such as sheet resistance by finding percolation networks and transmittance by finding area fractions. For zeolite membrane, we visualize three-dimensional defects structures, quantify the structures (porosity or tortuosity) and eventually estimate gas flux through the membrane.