A simple algorithm for measuring particle size distributions on an uneven background from TEM images

Nanoparticles have a wide range of applications in science and technology. Their sizes are often measured using transmission electron microscopy (TEM) or X-ray diffraction. Here, we describe a simple computer algorithm for measuring particle size distributions from TEM images in the presence of an uneven background. The approach is based on adaptive thresholding, making use of local threshold values that change with spatial coordinate. The algorithm allows particles to be detected and characterized with greater accuracy than using more conventional methods, in which a global threshold is used. Its application to images of heterogeneous catalysts is presented.