SIMULATION AND ANALYSIS OF MALTODEXTRIN PARTICLES OBSERVED BY SCANNING ELECTRON MICROSCOPY

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Abstract. Maltodextrin is a substance used to preserve the physicochemical and biological properties of many active compounds. The properties of maltodextrin are evaluated globally on a certain amount of dry matter (in powder form), in particular by analyzing the particle size distribution (PSD). This determination can be done directly by laser diffraction (LD) of dry matter or by analysis of scanning electron microscopy (SEM) images.

This work presents a technique for the segmentation of quasi-circular particles of maltrodextrin. From a gradient of the image, a circularity probability map is computed, which allows to isolate arcs of circles, used to search for circles thanks to an optimization method. Then, a simulation method of the SEM images allows to validate the method. This simulation is based on a random placement of disks, whose contours are randomly disturbed, and for which a grayscale depth and illumination are added to suggest a volume representation. The particle size distributions show the good results of the proposed method.