

Novel 2D and 3D imaging of internal aerated structure of ultrasonically treated foams and cakes using X-ray tomography and X-ray microtomography

ABSTRACT

The aerated structure of ultrasound treated foams and its resulted cake structures were examined using X-ray tomography and X-ray microtomography, leading to highly contrasted two-dimensional (2D) and three-dimensional (3D) images. Through these imaging techniques and software approaches, the effect of ultrasound treatment on the bubble size distribution was distinguished clearly. Microbubbles in foam which were in the size range of 0–0.00125 mm³ and in cakes which were in the range of 0–1 mm² increased by 48% and 29% respectively after ultrasonic treatment at a frequency of 20 kHz.

Keyword: X-ray microtomography; X-ray tomography; 2D image; 3D image; Aerated foam; Cake