

Contents

1	Introduction	1
1.1	Importance of Fats in Foods	1
1.2	Fats and Processing	2
1.3	Sonocrystallization	3
	References	5
2	An Overview of Ultrasound	7
2.1	Wave Propagation	7
2.1.1	General Aspects	7
2.1.2	Wave Propagation	8
2.1.3	Introduction to Ultrasonic Techniques	10
2.2	Diagnostic Ultrasound	11
2.3	High Frequency Ultrasound	11
2.4	Power Ultrasound	12
	References	13
3	Ultrasound Process Parameters	17
3.1	Acoustic Power, Intensity, and Attenuation	17
3.2	Calculation of Acoustic Power and Acoustic Intensity	19
3.2.1	Acoustic Power	19
3.2.2	Acoustic Intensity	21
3.3	Type of Sonicator Tip	22
	References	23
4	Common Uses of Power Ultrasound in the Food Industry	27
4.1	Ultrasound-Assisted Extraction	27
4.2	Emulsification	28
4.3	Viscosity Modifier	28
4.4	Defoaming	28
4.5	Pasteurization	29
4.6	Sonocrystallization	29
4.7	Other Uses of Power Ultrasound in Food Systems	29
	References	30

5	Mechanisms Involved in Sonocrystallization	35
5.1	Acoustic Cavitation	35
5.2	Rectified Diffusion	36
5.3	Sonocrystallization.	37
	References	39
6	Sonocrystallization of Fats	41
6.1	Anhydrous Milk Fat.	41
6.1.1	Experimental Conditions	41
6.1.2	Results and Discussion: Effect of Sonication on the Crystallization of AMF at Different Supercoolings	43
6.2	Palm Kernel Oil and Palm Oil	46
6.2.1	Experimental Conditions	46
6.2.2	Results and Discussion	47
6.3	All-Purpose Shortenings	49
6.3.1	Experimental Conditions	49
6.3.2	Results and Discussion	49
6.4	Pure Triacylglycerols	54
6.4.1	Experimental Conditions	54
6.4.2	Results and Discussion	54
6.5	Cocoa Butter.	56
6.5.1	Experimental Conditions	56
6.5.2	Results and Discussion	56
6.6	Bubble Formation in Lipid Samples.	57
6.6.1	Experimental Conditions	57
6.6.2	Results and Discussion	57
6.7	Other Effects to Consider	58
6.7.1	Effect of Power Ultrasound on Oxidation	58
6.7.2	Effect of Agitation on Power Ultrasound Efficiency	59
6.7.3	Effect of Power Ultrasound on Fat Chemical Composition.	60
6.8	Conclusions	60
	References	61
7	Future Trends	63
	Reference	64
	Index	65

Sonocrystallization of Fats

Martini, S.

2013, VI, 66 p. 11 illus., Softcover

ISBN: 978-1-4614-7692-4