

1. Record Nr.	UNINA9910145698003321
Autore	Smith P. G (Peter Geoffrey), <1954->
Titolo	Applications of fluidisation in food processing [[electronic resource] /] / P.G. Smith
Pubbl/distr/stampa	Oxford ; ; Ames, Iowa, : Blackwell Science, c2007
ISBN	0-470-69794-6 1-281-31205-3 9786611312053 0-470-99542-4 0-470-99541-6
Edizione	[1st ed.]
Descrizione fisica	1 online resource (264 p.)
Disciplina	664/.024
Soggetti	Fluidization Fluid dynamics Food industry and trade
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Applications of Fluidization to Food Processing; Contents; Preface; Glossary; Part One: Fundamentals of Fluidization; 1 A Description of Fluidized Bed Behaviour; An introduction to fluidization; Industrial applications of fluidization; Applications of fluidization in the food industry; Gas-solid fluidized bed behaviour; Influence of gas velocity; Geldart's classification; Bubbles and particle movement; Bubble formation at the distributor; Bubble growth and bubble shape; Minimum bubbling velocity; Bubble rise velocity; Particle movement due to bubble motion; Distributor plate design Characterisation of particulate solids Particle size distribution; Mean particle size; Particle shape; Bulk particle properties; Terminal falling velocity and particle drag coefficient; Minimum fluidizing velocity in aggregative fluidization; Voidage and pressure drop at incipient fluidization; Carman-Kozeny equation; Ergun equation; Minimum fluidizing velocity as a function of terminal falling velocity; Semi-empirical correlations; Experimental measurement; Fluidized bed behaviour at high gas velocities; Slugging; Turbulent fluidization and

fast fluidization; Elutriation and entrainment

Other types of fluidization Spouted beds; Centrifugal fluidization; Particulate fluidization; Nomenclature; References; 2 Characteristics of Aggregative Fluidization; Heat transfer; Correlations for heat transfer coefficients; Bed-surface heat transfer; Gas-particle heat transfer; Gas-particle heat transfer coefficient; Mass transfer; Correlations for mass transfer coefficients; Gas-particle mass transfer; Mixing; Introduction; Mechanisms of solids mixing; Mixing in fluidized beds; Vertical mixing of solids: the dispersion model; Rate of mixing; Mixing and segregation of dissimilar particles

Mechanisms Patterns of particle segregation; Examples of fluidized bed segregation; Nomenclature; References; Part Two: Applications; 3 Freezing; Low-temperature preservation of foods; Introduction; Industrial freezing equipment; Fluidized bed freezing; Capacity of fluidized bed freezers; Freezing rate and freezing point of foods; Prediction of freezing time; Design of fluidized bed freezers; Introduction; Heat transfer in fluidized bed freezers; Mixing, dispersion and residence time; Applications of fluidized bed freezing; Nomenclature; References; 4 Drying; Introduction; Principles of drying Water activity Effect of water activity on microbial growth; Effect of drying on food structure; Isotherms and equilibrium; Drying kinetics; Classification of driers; Fluidized bed drying; Material and energy balances; The well-mixed drier; The plug flow drier; Variations in fluidized bed drier design; Other fluidized bed drying techniques; Vibro-fluidization; Mechanical agitation; Centrifugal fluidization; Spouted bed drying; Microwave drying; Nomenclature; References; 5 Granulation; Granulation and particle growth; Particle-particle bonding; Bonding mechanisms Growth mechanisms in granulation

Sommario/riassunto

Fluidization is a technique that enables solid particles to take on some of the properties of a fluid. Despite being very widely used within the food processing industry, understanding of this important technique is often limited. Applications of Fluidization to Food Processing sets out the established theory of fluidization and relates this to food processing applications, particularly in: * Drying * Freezing * Mixing * Granulation * Fermentation This important and thorough book, written by Peter Smith, who has many years' experience teaching and researching in fo
