

Package ‘frambgrowth’

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Version 0.1.0

Title Simulation of the Growth of Framboidal and Sunflower Pyrite

Description Generation of theoretical size distributions of framboidal or sunflower pyrite.

The growth mechanisms used are surface and supply controlled and dependent or independent of size. The algorithms are fully described in the published work in *Mineralogy and Petrology* journal:

“Theoretical growth of framboidal and sunflower pyrite using the R-package frambgrowth”

The authors Merinero, R., and Cardenes, V. (2018).

<DOI:10.1007/s00710-017-0535-x>.

LazyLoad yes

LazyData yes

License GPL-2

RoxygenNote 6.0.1

NeedsCompilation no

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Framboids_growth	<i>Generate size distribution of framboidal pyrite based on different growth mechanisms</i>
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Description

Generate size distribution of framboidal pyrite based on different growth mechanisms

Usage

```
Framboids_growth(Number_Framboids = 1000, Initialization = TRUE, framboids,
  Simulation = 1, Initial_Diameter = 0, Nanocrystals_Diameter = 0.1,
  Packing_Factor = 0.74078, Random_Limit = 1, Iterations = 3,
  MaxMeanDiameter = 20)
```

Arguments

Number_Framboids	An integer indicanting the number of framboids to grow
Initialization	If TRUE the growth starts from empty framboids. If FALSE the growth continues from framboids
framboids	When Initialization=FALSE contains a framboids data_frame previously grown
Simulation	The growth mechanism to simulate. 1-4 surface-controlled, 5-6 supply-controlled, 1,3,5,6 size dependent, 2,4,7,8 size independent, 1,2,5,7 adding nanocrystals, 3,4,6,8 increasing diameter
Initial_Diameter	A number (in micrometers) representing the growth over preexistent spherical objects
Nanocrystals_Diameter	A number (in micrometers) with the diameter of nanocrystals forming framboids
Packing_Factor	A number from 0 to 1 representing the packing factor of nanocrystals
Random_Limit	A number from 0 to 1 representing the maximum value of random numbers in algorithm
Iterations	An integer value that controls the maximum number of iterations of the algorithm
MaxMeanDiameter	A number (in micrometers) controlling the maximum mean of the size distribution of framboids

Value

A framboids data_frame

References

Merinero, R.; Cardenes, V. (in press) ## Theoretical growth of framboidal and sunflower pyrite using the R-package frambgrowth. ## Mineralogy and Petrology. doi:10.1007/s00710-017-0535-x

See Also

[Sunflowers_growth](#)

Examples

```
## Size dependent and surface-controlled growth of 1000 framboids adding nanocrystals
## until the mean of the diameters of framboids was 15 micrometers.
library(frambgrowth)
Framboids<-Framboids_growth(100,Initialization=TRUE, Simulation=1,
Iterations=1000, MaxMeanDiameter=15)
## Size dependent and surface-controlled growth of 1000 framboids adding nanocrystals
## until the mean of the diameters of framboids was 10 micrometers,
## followed by size dependent and supply-controlled growth until the mean was 15 micrometers.
Framboids<-Framboids_growth(100,Initialization=TRUE, Simulation=1,
Iterations=1000, MaxMeanDiameter=10)
Framboids<-Framboids_growth(100,Initialization=FALSE, Simulation=5, framboids=Framboids,
Iterations=1000, MaxMeanDiameter=15)
```

Sunflowers_growth	<i>Generate size distribution of sunflower pyrite based on different growth mechanisms</i>
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Description

Generate size distribution of sunflower pyrite based on different growth mechanisms

Usage

```
Sunflowers_growth(Number_Sunflowers = 1000, Initialization = FALSE,
  framboids, sunflowers, Simulation = 1, Random_Limit = 1, Iterations = 3,
  MaxInfillingVolume = 0.1, MaxMeanDiameter = 20)
```

Arguments

Number_Sunflowers	An integer indicanting the number of sunflowers to grow
Initialization	If TRUE the growth starts from a framboids data_frame. If FALSE the growth continues from a sunflower data_frame
framboids	When Initialization=TRUE contains the framboid data_frame from which sunflower grow
sunflowers	When Initialization=FALSE contains a sunflower data_frame previously grown

Simulation	The growth mechanism to simulate. 1,3 surface-controlled, 2-4 supply-controlled, 1,2 size dependent, 3,4 size independent, 5 supply-controlled, increasing volume, size dependent
Random_Limit	A number from 0 to 1 representing the maximum value of random numbers in algorithm
Iterations	An integer value that controls the maximum number of iterations of the algorithm
MaxInfillingVolume	A value from 0 to 1-packed_factor indicating the maximum infilled volume of the framboidal core (Simulation = 5)
MaxMeanDiameter	A number (in micrometers) controlling the maximum mean of the size distribution of sunflowers

Value

A sunflower data_frame

See Also

[Framboids_growth](#) #' @references ## Merinero, R.; Cardenes, V. (in press) ## Theoretical growth of framboidal and sunflower pyrite using the R-package frambgrowth. ## Mineralogy and Petrology. doi:10.1007/s00710-017-0535-x

Examples

```
## Size dependent and surface-controlled growth of 100 framboids adding nanocrystals
## until the mean of the diameters of framboids was 10 micrometers followed by size dependent
## and supply-controlled growth until the mean of the diameter was 15 micrometers followed by
## supply-controlled, increasing volume and size dependent growth of sunflowers
## until the mean of the diameter was 20 micrometers
library(frmbgrowth)
Framboids<-Framboids_growth(100,Initialization=TRUE, Simulation=1,
Iterations=1000, MaxMeanDiameter=10)
Framboids2<-Framboids_growth(100,Initialization=FALSE, framboids=Framboids, Simulation=5,
Iterations=1000, MaxMeanDiameter=15)
Sunflowers<-Sunflowers_growth(100,Initialization=TRUE, framboids=Framboids2, Simulation=5,
Iterations=1000, MaxMeanDiameter=20)
```

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