Assignment: Module 1

The due date for submitting this assignment has passed. Due on 2018-02-05, 17:00 IST.

Submitted assignment

Fluidization Engineering Assignment 01

Module 1: Introduction and Particle Properties

Each question has only one correct answers and carries one mark. (1x25)

1) In a highly endothermic or exothermic reactions in a fluidized bed reactor the circulation rate of solid particles is chosen in such a way that

- All of these
- Improves automatic control of the system
- Avoiding sintering of catalyst particles
- To maintain the optimum temperature

No, the answer is incorrect.
Score: 0
Accepted Answers:
All of these

2) Backmixing of the particles occurs in the fluidized bed reactor which

- Decrease the efficiency of the system
- No effect on the efficiency
- Efficiency of the system first reach to minima then maxima
- Increases the efficiency of the system

No, the answer is incorrect.
Score: 0
Accepted Answers:
4) Dust extinction moisture is defined as
   - Both (a) and (b)
   - Moisture at which material emit dust
   - None of the above
   - Moisture at which material does not emit dust

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   Moisture at which material does not emit dust

5) Circularity is defined as
   - Actual area/area of an equivalent perimeter circle
   - Actual diameter/diameter of an equivalent area circle
   - Actual perimeter/perimeter of an equivalent area circle
   - None of the above

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   Actual perimeter/perimeter of an equivalent area circle

6) Convexity is defined as
   - Area bound by actual perimeter/area bound by convex hull perimeter
   - Actual perimeter/convex hull perimeter
   - Convex hull perimeter/actual perimeter
   - None of the above

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   Convex hull perimeter/actual perimeter

7) For the catalysts, reactivity changes with the concentration and particle size
   - Reactivity inversely proportional to concentration and particle size
   - None of the above
   - Reactivity directly proportional to concentration and particle size
   - Reactivity exponentially proportional to concentration and particle size

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   Reactivity directly proportional to concentration and particle size

8) Attraction between particles in a liquid suspension is better expressed in terms of

   Fluidization Engineering - - Unit 2 - Introduction... https://onlinecourses.nptel.ac.in/noc18_ch10/un...
9. Calculate the sphericity of a cylinder of diameter 1 cm and height 3 cm. 

- 0.586
- 0.685
- 0.779
- 0.977

No, the answer is incorrect.
Score: 0
Accepted Answers: 
0.779

10. Density of a solid particle used in fluidization is 

- Both (a) and (b)
- Bulk density of solid
- Flowing fluid density
- True solid density

No, the answer is incorrect.
Score: 0
Accepted Answers: 
True solid density

11. Freeboard region in fluidized bed reactor is known as 

- Distributor region
- Feed inlet region
- Region extending from top of the bed surface to the top of reactor vessel
- Only present in the pneumatic fluidization

No, the answer is incorrect.
Score: 0
Accepted Answers: 
Region extending from top of the bed surface to the top of reactor vessel

12. Which of the flowing is undesirable in the fluidized bed reactor 

- High mass transfer coefficient
- Attrition of the particles
- High heat transfer coefficient
- Enhanced contact efficiency

No, the answer is incorrect.
Score: 0

Accepted Answers:
Attrition of the particles

13) The condition at which packed bed considered to be incipiently fluidized is

- Pressure drop through any section of the bed equals the weight of fluid and particles in that section
- Frictional force between particle and fluid just counterbalances the weight of the particles
- All of these
- Incipiently fluidized can be termed as minimum fluidization

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of these

14) Aspect ratio is defined as

- Both (a) and (b)
- Width/length
- Length/width
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Width/length

15) Highest size distribution variance is observed in what type of fluidization mechanism

- Segregation fluidization
- Both (a) and (b)
- Sluggish fluidization
- Particle and powder fluidization

No, the answer is incorrect.
Score: 0

Accepted Answers:
Segregation fluidization

16) For mass transfer and gas-liquid reaction $d_{32}$ is

- Volume diameter mean
- Volume diameter mean
- Volume mean
- Sauter mean

No, the answer is incorrect.
Score: 0

Accepted Answers:
Sauter mean

17) The sphericity of a cubical particle is
18. Choose the correct sequence of fluidization according to increasing flow rate:  
- Bubbling - slugging - turbulent - lean fluidization
- Bubbling - turbulent - slugging - lean fluidization
- Bubbling - pneumatic - turbulent - slugging
- Bubbling - pneumatic - slugging - turbulent

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
Bubbling - slugging - turbulent - lean fluidization

19. For a spherical particle of diameter D, sphericity is equal to:  
- 0.806
- 1.25
- 0.75
- 1

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
1

20. Drag coefficient for turbulent region:  
- 0.67
- 0.44
- 16/Re
- 24/Re

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
0.44

21. Weber number is defined as:  
- Surface force / Inertial force
- Pressure / Inertial force
- Viscous force / Inertial force
- Inertial force / Surface tension

No, the answer is incorrect.  
Score: 0
A powder is having particle size between 50-80 µm, the nature of force exhibit by this powder

- Cohesive
- Spoutable
- Areatable
- Bubbling

No, the answer is incorrect.
Score: 0

Accepted Answers:
Areatable

23 Calculate terminal velocity for laminar region \(d_p = 1\) mm, \(\rho_p = 7830\) kg/m\(^3\), \(\rho_f = 800\) kg/m\(^3\) and \(\mu = 0.1277\) Ns/m\(^2\)

- \(u_t = 0.029\) m/s
- \(u_t = 0.3\times10^{-3}\) m/s
- \(u_t = 0.078\) m/s
- \(u_t = 0.78\times10^{-3}\) m/s

No, the answer is incorrect.
Score: 0

Accepted Answers:
\(u_t = 0.029\) m/s

24 Terminal velocity is the function of

- Both (a) and (b)
- Friction force
- Surface tension
- Drag force

No, the answer is incorrect.
Score: 0

Accepted Answers:
Drag force

25 When net force acting on a droplet becomes zero, it falls with

- Zero speed
- Constant velocity
- Increasing speed
- Decreasing speed

No, the answer is incorrect.
Score: 0

Accepted Answers:
Constant velocity

You were allowed to submit this assignment only once.