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Courses » Fundamentals of Material Processing - I

Announcements Course Ask a Question Progress



## Unit 8 - week 7

### Course outline

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- Lecture 31 - Powder Characterization using Gas Permeability Method
- Lecture 32 - Powder Manufacturing
- Lecture 33 - Powder Manufacturing continued...
- Lecture 34 - Powder Manufacturing continued...
- Lecture 35 - Powder Consolidation
- Quiz : Assignment-7
- Assignment 7 Solution

week 8

### Assignment-7

The due date for submitting this assignment has passed. **Due on 2017-09-10, 23:59 IST**  
As per our records you have not submitted this assignment.

1) Driving force for agglomeration is \_\_\_\_\_

1 point

- Reduction in surface energy
- Reduction in volume energy
- Formation of atomic bonds
- Reduction in chemical energy

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*Reduction in surface energy*

2) Which of the following structures possess highest packing fraction and highest coordination number? **1 point**

- Simple cubic packing
- Face centered cubic packing
- Loose random packing
- Dense random packing

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*Face centered cubic packing*

3) Which one of the following is true regarding oxide reduction method of fabrication of iron powder? **1 point**

- Milling of the oxide is not necessary
- Low temperature is advantageous as it ensures small time for completion of oxide reduction
- Extent of the reaction depends upon ratio of partial pressure of water-vapor to hydrogen
- Reaction does not depend upon solid state diffusion

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*Extent of the reaction depends upon ratio of partial pressure of water-vapor to hydrogen*

4) Which one of the following is true regarding Electrolytic technique for powder fabrication? **1 point**

- Very high purity particulates can be obtained
- Alloys and compounds can be easily manufactured using this technique
- Spherical particles are obtained in this technique
- Particles obtained are of uniform shape and size

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*Very high purity particulates can be obtained*

5) How can you ball mill a material if it is ductile?

1 point

- By using hard milling media
- By using large sized milling media
- By hydrogenation of the powder particles to make it brittle
- By increasing the speed of rotation of the jar which contains the powder particle and milling media



**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*By hydrogenation of the powder particles to make it brittle*

6) Which of the following is true regarding the particle size of the particle during ball-milling?

1 point

- If one mills for infinitely long time, particle size can be reduced infinitesimally smaller
- The impact stress required for fracture remains constant with decreasing particle size
- If the speed of rotation is increased, the particle size can be reduced further
- There is a smallest particle size beyond which particles cannot be broken down further, for a given system of ball mill



**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*There is a smallest particle size beyond which particles cannot be broken down further, for a given system of ball mill*

7) Silicon carbide powder is produced by\_\_\_\_\_

1 point

- Bayer's technique
- Acheson Process
- Spray Drying
- Freeze Drying

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*Acheson Process*

8) Q 8 and Q9 are based on this:

1 point

One hundred grams of iron oxide (FeO) is reacted with 1000 cm<sup>3</sup> of pure hydrogen (STP) in a closed system at one atmosphere using a temperature of 400 °C for an extended time. What is the weight of the pure Fe that would be formed? Assume that FeO is stable at 400 °C ( $w_{H_2} = 2$  gm/mole;  $w_{Fe} = 56$  gm/mole)

Calculate the number of moles of H<sub>2</sub> remaining after reaction and number of moles of H<sub>2</sub>O formed after reaction.

- $n(H_2) = 0.1$ ;  $n(H_2O) = 0.1$
- $n(H_2) = 0.1$ ;  $n(H_2O) = 0.0041$
- $n(H_2) = 0.0405$ ;  $n(H_2O) = 0.1$
- $n(H_2) = 0.0405$ ;  $n(H_2O) = 0.0041$

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

$$n(\text{H}_2) = 0.0405; n(\text{H}_2\text{O}) = 0.0041$$

9) What is the weight of pure Fe that would be formed from this reaction?

1 point

- 22.9 gm Fe
- 2.29 gm Fe
- 0.229 gm Fe
- 0.023 gm Fe

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*0.229 gm Fe*

10) During Gas atomization, which of the following is NOT true?

1 point

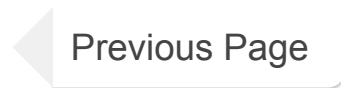
- The particle shape is usually spherical
- Sometime satellite particles are formed due to high superheat of the melt
- Higher the energy input, smaller are the particle size
- Higher the operating temperature, smaller are the particle size

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*Sometime satellite particles are formed due to high superheat of the melt*



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