Quiz 2

Test Your Knowledge!!

You have scored 15 out of 15.

Your level is: Jeopardy Ready

1. Adsorption of a pure gas A on activated carbon follows the Langmuir isotherm– Q= 6.4*p /(1+1.53*p), p in kPa and q in mmol/g. If the molecular weight of A is 65, what is the maximum quantity of gas (in kg adsorbate per kg carbon) that can be adsorbed?

(a) 0.712

(b) 0.272

(c) 0.523

(d) None of these

You have chosen option (b). The answer is correct.

That's right! The letter A is the first letter in the alphabet!

2. Adsorbents of a small particle size are preferred for liquid separation compared to gas separation because –

(a) Larger particles may be more porous and diffusional resistance is lower

(b) The adsorption capacity of smaller particles is larger

(c) The resistance to diffusion through the liquid-filled pores is greater than that in the case of a gas

(d) All of the above

You have chosen option (c). The answer is correct.

Nice! Your cholesterol level is probably doing alright.

3. The entropy change for adsorption is

(a) Negative

(b) Zero

(c) Positive

(d) It can vary

You have chosen option (a). The answer is correct.

Brilliant! You're seriously a genius, (wo)man.

4. An adsorption process is

(a) Always Exothermic

(b) Always Endothermic

(c) Can be both

(d) Invalid

You have chosen option (a). The answer is correct.

Holy bananas! I didn't actually expect you to know that! Correct!

5. Which of the following orientations of an adsorption vessel provides a satisfactory flow distribution of the feed?

(a) Vertical bed

(b) Horizontal bed

(c) Bed of any orientation

(d) It depends on case to case

You have chosen option (a). The answer is correct.

Good Job! You must be very observant!

6. A sample of activated alumina may have pores as small as 5 nm. What should be the minimum mercury pressure to ensure filling up these pores in a mercury porosimeter?

(a) 100 bar

(b) 1000 bar

(c) 2000 bar

(d) 10000 bar

You have chosen option (c). The answer is correct.

Good Job! You must be very observant!

7. How is the breakthrough concentration defined for adsorption in a packed bed?

(a) It is the minimum detectable or maximum allowable concentration in the effluent from the bed.

(b) It is approximately half of the solute concentration in the feed.

(c) It is the maximum solute concentration in the effluent.

(d) None of the above

You have chosen option (a). The answer is correct.

Good Job! You must be very observant!

8. The length of the unused bed is more if the mass transfer zone is:

(a) Wide

(b) Narrow

(c) Asymmetric

(d) None of the above

You have chosen option (c). The answer is correct.

Good Job! You must be very observant!

9. A packed bed has a bulk density of 510 kg/m3, and the particles have a density of 770 kg/m3. The bed porosity is:

(a) 66 %

(b) 51 %

(c) 34 %

(d) 10 %

You have chosen option (c). The answer is correct.

Good Job! You must be very observant!

10. What is the major use of carbon molecular sieve (CMS)?

(a) Separation of lower hydrocarbons

(b) Adsorption of organics from drinking water

(c) Separation of organics from drinking water

(d) None of these

You have chosen option (c). The answer is correct.

Good Job! You must be very observant!

11. Adsorption capacity of a regenerated bed compared to the fresh bed is generally

(a) Slightly less

(b) Slightly more

(c) Half of that of the fresh bed after the first regeneration

(d) None of the above

You have chosen option (a). The answer is correct.

Good Job! You must be very observant!

12. How does the depth of mass transfer zone change with increasing selectivity coefficient KAB for mono-monovalent ion exchange?

(a) Increases

(b) Decreases

(c) Remains almost the same

(d) None

You have chosen option (b). The answer is correct.

Good Job! You must be very observant!

13. If the adsorption rate of the solute is infinitely fast and irreversible, the thickness of the Mass Transfer Zone would be

(a) Very large

(b) About half of the bed length

(c) Zero

(d) None

You have chosen option (c). The answer is correct.

Good Job! You must be very observant!

14. If the mass transfer resistance is very small, the breakthrough line is:

(a) Vertical line

(b) Horizontal line

(c) A line of unit slope

(d) Variable

You have chosen option (a). The answer is correct.

Good Job! You must be very observant!

15. If the saturated zone of a bed expands at a rate u` (m/h) and the stoichiometric front moves at a constant velocity us (m/h), then

(a) u` = us

(b) u` > us

(c) u` < us

(d) It depends on condition

You have chosen option (a). The answer is correct.

Good Job! You must be very observant!