CHEMISTRY

AAKASH INSTITUTE ENGLISH

MOCK TEST 36

Exercise

1. What are Grignard reagents? Give a chemical reaction for their preparation

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2. Choose the secondary alcohol among the following

A. Isobutyl alcohol

B. Isopropyl alcohol

C. Isopentyl alcohol

D. Neopentyl alcohol

Answer: B

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3. The alcohol having least solubility in water is

A. Ethanol

B. 1-Propanol

C. 1-Butanol

D. 1-Pentanol

Answer: D

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4. The correct structure of hydroquinone or quinol is

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5. In acid catalysed hydration of alkenes, reaction intermediate formed is

A. Free radical

B. Carbocation

C. Carbanion

D. Carbene

Answer: B

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6. A metal X has a BCC structure with nearest neighbor distance 365.9 pm. What is metal X if its density is 1.0016 g cm^{-3}?

A. Aluminum

B. Magnesium

C. Sodium

D. Potassium

Answer: B

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7. Lithium forms a BCC lattice with an edge length of 350 pm. The experimental density of lithium is 0.53 g cm-3. What is the percentage of missing lithium atoms? (Atomic mass of Lithium = 7 amu)

A. 97.7%

B. 95.4%

C. 4.6%

D. 2.3%

Answer: B

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8. An element of density 8.0 g/cm3 forms an FCC lattice with unit cell edge of 300 pm.

Calculate the number of atoms present in 0.5kg of the element.

A. $95x10^{23}$ atoms

B. $93.59x10^{23}$ atoms

C. $92.59x10^{23}$ atoms

D. $91.38x10^{23}$ atoms

Answer: B

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9. Phenol is also known as

A. Phenolic acid

B. Hydroxy cinnamic acid

C. Carbolic acid

D. Hydroxy carbolic acid

Answer: C

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10. If the radius of a Chloride ion is 0.154 nm, then what is the maximum size of a cation that can fit in each of its octahedral voids?

A. 1.15 x 10^{-1} nm

B. 1.21 x 10^{-1} nm

C. 1.18 x 10^{-1} nm

D. 1.13 x 10^{-1} nm

Answer: D

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11. The correct order of boiling point is:

A. n-butane lt ethoxyethane lt pentan-1-ol

B. n-butane ltpentan-1-olltethoxyethane

C. Ethoxyethane ltn-butane lt pentan-1-ol

D. Pentan-1-ol ltethoxyethane ltn-bulane

Answer: A

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12. When cumene is oxidised in the presence of air followed by treatment with dilute acid, the products obtained are

A. Benzoic acid and Methanol

B. Phenol and Acetone

C. Benzoic acid and Acetone

D. Phenol and Acetaldehyde

Answer: B

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13. Rubidium Chloride (RbCl) has NaCl like structure at normal pressures. If the radius of the Chloride ion is 1.54 Å, what is the unit cell edge length for RbCl? (Assuming anion-anion contact)

A. 4.25 A°

B. 4.78 A°

C. 4.35 A°

D. 5.14 A°

Answer: B

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14. A metal crystallises as body centred cubic lattice with the edge length of unit cell equal to 0.304 nm. If the molar mass of the metal is 50.3 gmol^{-1} , its density (in g cm^{-3}) is :

A. 5.945

B. 2.9725

C. 8.915

D. 4.458

Answer: C

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15. Calculate the density of diamond from the fact that it has a face-centered cubic structure with two atoms per lattice point and unit cell edge length of 3.569×10^{-8} cm.

A. 3.509 g cm^{-3}

B. 7.012 g cm^{-3}

C. 5.012 g cm^{-3}

D. 1.206 g cm^{-3}

Answer: D

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16. Which of the following statement is correct for alcohols?

A. They react only as a nucleophile

B. They react only as an electrophile

C. They react both as a nucleophile and an electrophile

D. They neither react as a nucleophile nor an electrophile

Answer: C

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17. A metal crystallizes into two cubic phases BCC and FCC. The ratio of densities of FCC and BCC is equal to 1.5. Calculate the difference

between the unit cell lengths of the FCC and BCC crystals if the edge length of the FCC crystal is equal to 4.0 Å.

A. 0.5 Å

B. 0.37 Å

C. 0.28 Å

D. 0.73 Å

Answer: D

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18. An element with cell edge of 288 pm has a density of 7.2 g cm-3. What type of structure does the element have if it's atomic mass M=51.8 g mol-1?

A. Body-Centred Cubic (BCC)

B. Face-Centred Cubic (FCC)

C. Simple Cubic

D. Hexagonal Closed Packing (HCP)

Answer: C

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19. Sodium metal crystallises in bcc lattice with the cell adge, a equal to 42.29 A° . What is the radius (in A°) of sodium atom?

A. 1.86

B. 1.90

C. 18.3

D. 1.21

Answer: C

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20. Acetylation of salicylic acid produces

A. Adipic acid

B. Picric acid

C. Glutaric acid

D. Aspirin

Answer: D

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21. If metallic atoms of mass 197 and radius 166 pm are arranged in ABCABC fashion then what is the surface area of each unit cell?

A. $1.32 \times 10^{6} pm2$

B. $1.32 \times 10^{-18} pm2$

C. $2.20 \times 10^{5} pm2$

D. $2.12 \times 10^{-19} pm2$

Answer: B

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22. If copper, density = 9.0 g/cm3 and atomic mass 63.5, bears face-centered unit cells then what is the ratio of surface area to volume of each copper atom?

A. 0.0028

B. 0.0235

C. 0.0011

D. 0.0323

Answer: B

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23. Formation of Salicylic acid from phenol (Kolbe's reaction) is an example of

A. Electrophilic addition reaction

B. Nucleophilic addition reaction

C. Electrophilic substitution reaction

D. Nucleophilic substitution reaction

Answer: C

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24. Reaction intermediate formed in the formation of salicylaldehyde from phenol (Reimer-Tiemann reaction) is

A. Carbocation

B. Free radical

C. Carbanion

D. Carbene

Answer: D

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25. If a metal forms a FCC lattice with unit edge length 500 pm. Calculate the density of the metal if its atomic mass is 110.

A. $2923 kgm^{-3}$

B. $5846 kgm^{-3}$

C. $8768 kgm^{-3}$

D. $1750 kgm^{-3}$

Answer: C

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26. What is the radius of a metal atom if it crystallizes with body-centered lattice having a unit cell edge of 333 Pico meter?

A. 1538.06 pm

B. 769.03 pm

C. 288.38 pm

D. 144.19 pm

Answer: C

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27. ΔHvap for water is 40.7 KJ mol^{-1} . The entropy of vaporization of water is:

A. 407 J $mol^{-1}k^{-1}$

B. 756 J $mol^{-1}k^{-1}$

C. 109 J $mol^{-1}k^{-1}$

D. 40.7 kJ/mol

Answer: B

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28. The enthalpy of vaporization for water is 186.5 KJ mol^{-1} ,the entropy of its vaporization will be:

A. 4.07 J $mol^{-1}k^{-1}$

B. 1.02 KJ $mol^{-1}k^{-1}$

C. 0.7 J $mol^{-1}k^{-1}$

D. 0.5 KJ $mol^{-1}k^{-1}$

Answer: B

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29. The enthalpy of vaporization of liquid is 40 kJ mol^{-1} and entropy of vaporization is 64 J $mol^{-1}k^{-1}$. The boiling point of the liquid is

A. 625 K

B. 254 K

C. 456 K

D. 725 K

Answer: C

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30. At NTP, the solubility of natural gas in water is 0.8 mole of gas/kg of water. What is the Henry's law constant for natural gas?

A. 8 kN/m^2

B. 7.90 x 10^{-3}Pa

C. 71.36 bar

D. 105 mmHg

Answer: B

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