NUNAVUT CHEMISTRY 20 · FINAL EXAM · 50 QUESTIONS

Final Exam — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **Calcium forms a Ca^{2+} ion and chlorine forms a Cl^{-} ion. The formula of calcium chloride is**

- A $CaCl_2$
- B Ca_2Cl
- C $CaCl$
- D $CaCl_3$

Understand It with Pulse | Flag a mistake

2 **A gas pressure of 303.9 kPa is equivalent to Use 1.00 atm = 101.325 kPa.**

A 0.333 atm

B 3.00 atm

C 30.0 atm

D 0.0300 atm

Understand It with Pulse | Flag a mistake

3 **Which statement about an aqueous solution is correct?**

A Water is always the solute in an aqueous solution

B An aqueous solution must contain an ionic solute

C Water is the solvent in an aqueous solution

D An aqueous solution is always a strong electrolyte

Understand It with Pulse | Flag a mistake

4 **The mass of 0.250 mol of sodium chloride, NaCl (molar mass 58.44 g/mol), is**

A 14.6 g

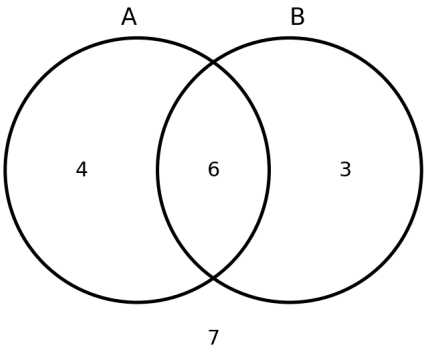
B 7.31 g

C 29.2 g

D 234 g

Understand It with Pulse | Flag a mistake

5 **In the Venn diagram below, set A is substances that conduct electricity when molten and set B is substances with a high melting point. A substance is ionic if it is in both sets. How many of the substances in the diagram are ionic?**



- **A** 3
- **B** 4
- **C** 6
- **D** 7

Understand It with Pulse | Flag a mistake

6 **A gas sample is cooled to a temperature of -23°C. Its temperature, in kelvin, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

7 **A 100 mL sample of 2.0 mol/L hydrochloric acid is diluted with water to a final volume of 500 mL. The concentration of the diluted acid is**

- A 0.10 mol/L
- B 1.0 mol/L
- C 0.40 mol/L
- D 10 mol/L

Understand It with Pulse | Flag a mistake

8 **Use the atomic masses N = 14.01, H = 1.01, O = 16.00 g/mol. The percent by mass of nitrogen in NH_4NO_3 is**

- A 17.5%
- B 35.0%
- C 52.5%
- D 70.0%

Understand It with Pulse | Flag a mistake

9 **The total number of atoms in one formula unit of ammonium nitrate, NH_4NO_3, is ____.**

ANSWER _____

Understand It with Pulse | Flag a mistake

10 **An automobile tire has a gas pressure of 210 kPa at 20°C. After driving, the temperature of the air in the tire rises to 50°C while the volume stays constant. The new pressure in the tire is**

A 232 kPa

B 191 kPa

C 525 kPa

D 210 kPa

Understand It with Pulse | Flag a mistake

11 **A solution that contains undissolved solute, and in which the rate of dissolving equals the rate of crystallizing, is best described as**

- A unsaturated
- B dilute
- C concentrated
- D saturated

Understand It with Pulse | Flag a mistake

12 **$2\ H_2(g) + O_2(g) \rightarrow 2\ H_2O(l)$**
The number of moles of $O_2(g)$ required to react completely with 6.0 mol of $H_2(g)$ is

- A 1.5 mol
- B 3.0 mol
- C 6.0 mol
- D 12 mol

Understand It with Pulse | Flag a mistake

13 **Aluminum forms an Al^{3+} ion, and the sulfate ion is SO_4^{2-}. In the formula of aluminum sulfate, the total number of oxygen atoms is _____.**

ANSWER _____

Understand It with Pulse | Flag a mistake

14 **A sample of gas occupies 3.0 L at a pressure of 150 kPa and a temperature of 27°C. Use R = 8.314 L· kPa/(mol· K). The amount of gas, to the nearest thousandth of a mole, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

15 **A student must prepare 500.0 mL of 0.250 mol/L NaOH(aq) from solid sodium hydroxide, molar mass 40.00 g/mol. The mass of NaOH(s) required, to the nearest hundredth of a gram, is _____ g.**

ANSWER _____

Understand It with Pulse | Flag a mistake

16 **$2\ Al(s) + 3\ Cl_2(g) \rightarrow 2\ AlCl_3(s)$**
If 4.00 mol of Al(s) and 4.00 mol of $Cl_2(g)$ are mixed and allowed to react as completely as possible, then

A $Cl_2(g)$ is the limiting reactant and 2.67 mol of $AlCl_3(s)$ forms

B Al(s) is the limiting reactant and 4.00 mol of $AlCl_3(s)$ forms

C $Cl_2(g)$ is the limiting reactant and 4.00 mol of $AlCl_3(s)$ forms

D Al(s) is the limiting reactant and 2.67 mol of $AlCl_3(s)$ forms

Understand It with Pulse | Flag a mistake

17 **The total number of valence electrons in a molecule of carbon dioxide, CO_2, is ____.**

ANSWER _____

Understand It with Pulse | Flag a mistake

18 **A sample of gas occupies 600 mL at 20°C. The gas is heated at constant pressure to 80°C. The new volume of the gas, to the nearest millilitre, is ____**

ANSWER _____

Understand It with Pulse | Flag a mistake

19 **A student dissolves 5.85 g of NaCl(s), molar mass 58.44 g/mol, in enough water to make 500 mL of solution. The concentration of the solution, to the nearest hundredth, is ____ mol/L.**

ANSWER _____

Understand It with Pulse | Flag a mistake

20 **A 0.500 mol sample of an unknown gas has a mass of 32.0 g. The molar mass of the gas, in g/mol, to the nearest whole number, is ____**

ANSWER _____

Understand It with Pulse | Flag a mistake

21 **A sulfur atom has 6 valence electrons. The number of electrons a sulfur atom gains when it forms its most common ion is ____.**

ANSWER _____

Understand It with Pulse | Flag a mistake

22 **A gas is collected over water at 25°C. The total pressure of the collected gas is 101.3 kPa, and the vapour pressure of water at 25°C is 3.17 kPa. The pressure of the dry gas is**

A 3.17 kPa

B 98.1 kPa

C 101.3 kPa

D 104.5 kPa

Understand It with Pulse | Flag a mistake

23 **Hydrochloric acid and ethanoic acid solutions are both 0.10 mol/L. The HCl(aq) conducts electricity much better than the ethanoic acid mainly because**

A ethanoic acid does not dissolve in water

B HCl ionizes completely, producing a higher concentration of ions

C ethanoic acid has a larger molar mass than HCl

D HCl contains more hydrogen atoms per molecule than ethanoic acid

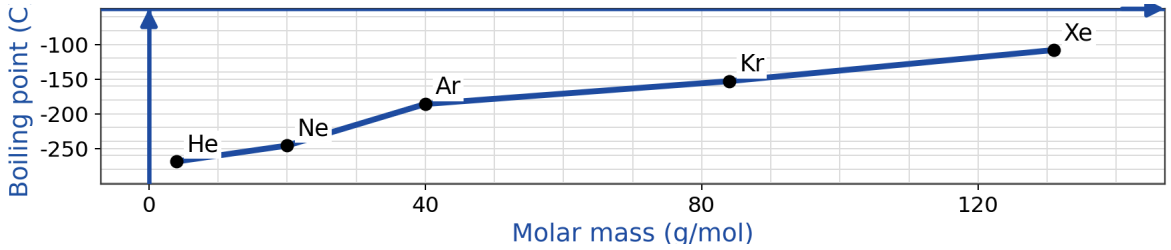
Understand It with Pulse | Flag a mistake

24 **A compound has an empirical formula of CH_2O (empirical formula mass 30.03 g/mol) and a molar mass of 180.16 g/mol. Its molecular formula is**

- **A** $C_2H_4O_2$
- **B** $C_3H_6O_3$
- **C** $C_6H_{12}O_6$
- **D** $C_{12}H_{24}O_{12}$

Understand It with Pulse | Flag a mistake

25 **The graph below plots the boiling point of each noble gas against its molar mass. Which noble gas has the strongest London dispersion forces?**



A He

B Ar

C Kr

D Xe

Understand It with Pulse | Flag a mistake

26 When the value R = 8.314 L· kPa/(mol· K) is used in the ideal gas law, the temperature must be in ____ and the pressure in ____.

- A Degrees Celsius and kilopascals
- B Kelvin and kilopascals
- C Kelvin and atmospheres
- D Degrees Celsius and atmospheres

Understand It with Pulse | Flag a mistake

27 A 250.0 mL sample of 0.100 mol/L solution is to be prepared by diluting a 1.50 mol/L stock solution. The volume of stock solution required, to the nearest tenth of a millilitre, is ____ mL.

ANSWER _____

Understand It with Pulse | Flag a mistake

28 $Zn(s) + 2\ HCl(aq) \rightarrow ZnCl_2(aq) + H_2(g)$

A student reacts 13.0 g of Zn(s) (65.38 g/mol) with excess HCl(aq) and collects 0.175 mol of $H_2(g)$. The percent yield, to the nearest whole percent, is ____ %

ANSWER _____

Understand It with Pulse | Flag a mistake

29 **In the compound SnF_2, each tin ion has a charge of 2+. The correct name of this compound is**

A tin difluoride

B tin fluoride

C tin(I) fluoride

D tin(II) fluoride

Understand It with Pulse | Flag a mistake

30 **A sealed spray can is left in a hot vehicle, and its internal pressure increases. According to the kinetic molecular theory, this happens because the gas particles**

A Collide with the walls more often and with greater force

B Expand so that each particle takes up more space

C Are attracted to each other more strongly

D Increase in number as the temperature rises

Understand It with Pulse | Flag a mistake

31 **A student dissolves 1.5 mol of solute in enough water to make 500 mL of solution. The concentration of the resulting solution is**

- A 0.33 mol/L
- B 0.75 mol/L
- C 3.0 mol/L
- D 1.5 mol/L

Understand It with Pulse | Flag a mistake

32 **Use the atomic masses Mg = 24.31, N = 14.01, O = 16.00 g/mol. The molar mass of $Mg(NO_3)_2$ is**

- A 148.33 g/mol
- B 86.32 g/mol
- C 124.33 g/mol
- D 196.35 g/mol

Understand It with Pulse | Flag a mistake

33 **The correct name of N_2O_4 is**

- A nitrogen tetroxide
- B dinitrogen tetroxide
- C dinitrogen oxide
- D nitrogen(IV) oxide

Understand It with Pulse | Flag a mistake

34 **A gas pressure of 1520 mmHg is equivalent to Use 760 mmHg = 1.00 atm.**

- A 0.500 atm
- B 1.00 atm
- C 2.00 atm
- D 4.00 atm

Understand It with Pulse | Flag a mistake

35 **The titration curve below shows the pH as sodium hydroxide solution is added to an acid. At what volume of base added is the equivalence point reached?**

A 20 mL

B 30 mL

C 40 mL

D 50 mL

Understand It with Pulse | Flag a mistake

36 **Use the atomic masses H = 1.01, S = 32.07, O = 16.00 g/mol. The percent by mass of oxygen in H_2SO_4 is**

A 32.7%

B 49.0%

C 81.6%

D 65.2%

Understand It with Pulse | Flag a mistake

37 **A potassium atom forms its most common ion by**

- A losing 1 electron
- B gaining 1 electron
- C losing 2 electrons
- D gaining 7 electrons

Understand It with Pulse | Flag a mistake

38 **A syringe contains 1.5 L of gas at 27°C. At constant pressure, the gas is heated to 327°C. The new volume of the gas is**

- A 18 L
- B 0.75 L
- C 1.7 L
- D 3.0 L

Understand It with Pulse | Flag a mistake

39 **Which of the following 0.10 mol/L solutions conducts electricity only slightly?**

- A HCl(aq)
- B NaOH(aq)
- C $KNO_3(aq)$
- D $CH_3COOH(aq)$

Understand It with Pulse | Flag a mistake

40 **$C_3H_8(g) + 5\ O_2(g) \rightarrow 3\ CO_2(g) + 4\ H_2O(g)$**
The number of moles of $CO_2(g)$ produced when 2.50 mol of $C_3H_8(g)$ burns completely is

- A 2.50 mol
- B 5.00 mol
- C 10.0 mol
- D 7.50 mol

Understand It with Pulse | Flag a mistake

41 **The shape of an ammonia molecule, NH_3, is**

- A trigonal pyramidal
- B tetrahedral
- C bent
- D trigonal planar

Understand It with Pulse | Flag a mistake

42 **Oxygen makes up 21% of the air in a room, and the total air pressure is 101.3 kPa. The partial pressure of oxygen in the room is**

- A 80.0 kPa
- B 21.3 kPa
- C 101.3 kPa
- D 482 kPa

Understand It with Pulse | Flag a mistake

43 **A solution has a hydronium ion concentration of 2.5×10^{-3} mol/L. The pH of the solution, to the nearest hundredth, is _____**

ANSWER

Understand It with Pulse | Flag a mistake

44 **$Mg(s) + 2\ HCl(aq) \rightarrow MgCl_2(aq) + H_2(g)$**
A student reacts 4.86 g of Mg(s) (24.31 g/mol) with excess HCl(aq) and collects 0.180 mol of $H_2(g)$. The percent yield of the reaction is

A 45.0%

B 90.0%

C 80.0%

D 111%

Understand It with Pulse | Flag a mistake

45 **The correct name of the hydrate $CuSO_4 \cdot 5H_2O$ is**

- **A** copper(II) sulfate pentahydrate
- **B** copper(I) sulfate pentahydrate
- **C** copper sulfate pentahydrate
- **D** copper(II) sulfite pentahydrate

Understand It with Pulse | Flag a mistake

46 **At SATP (25°C and 100 kPa), the molar volume of any gas is 24.8 L/mol. The volume occupied by 2.50 mol of a gas at SATP is**

- **A** 56.0 L
- **B** 9.92 L
- **C** 62.0 L
- **D** 24.8 L

Understand It with Pulse | Flag a mistake

47 **The two major gases released by the combustion of fossil fuels that are responsible for acid deposition are**

- **A** carbon dioxide and oxygen
- **B** methane and carbon monoxide
- **C** ozone and hydrogen
- **D** sulfur dioxide and nitrogen oxides

Understand It with Pulse | Flag a mistake

48 **$2\ NaN_3(s) \rightarrow 2\ Na(s) + 3\ N_2(g)$**
An airbag uses the decomposition of $NaN_3(s)$ (65.0 g/mol). The volume of $N_2(g)$ produced at STP when 65.0 g of $NaN_3(s)$ decomposes completely is

- **A** 22.4 L
- **B** 11.2 L
- **C** 33.6 L
- **D** 44.8 L

Understand It with Pulse | Flag a mistake

49 **Which of the following molecules is polar?**

A $CHCl_3$

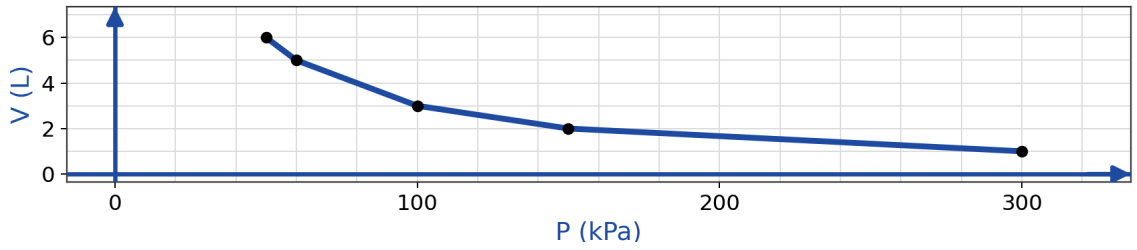
B CCl_4

C BF_3

D CH_4

Understand It with Pulse | Flag a mistake

50 **The volume-pressure graph below is for a fixed amount of gas at constant temperature. What is the volume of the gas when its pressure is 100 kPa?**



- **A** 1.0 L
- **B** 2.0 L
- **C** 3.0 L
- **D** 6.0 L

Understand It with Pulse | Flag a mistake

ANSWER KEY

1. A
2. B
3. C
4. A
5. C
6. 250
7. C
8. B
9. 9
10. A
11. D
12. B
13. 12
14. 0.18
15. 5
16. A
17. 16
18. 723
19. 0.2
20. 64
21. 2
22. B
23. B
24. C
25. D
26. B
27. 16.7
28. 88
29. D
30. A
31. C
32. A
33. B
34. C
35. B
36. D
37. A
38. D
39. D
40. D
41. A
42. B
43. 2.6
44. B
45. A
46. C
47. D
48. C
49. A
50. C

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