NORTHWEST TERRITORIES CHEMISTRY 12 (MCH--12) · 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 **The rate of a reaction is best described as the**

- A change in concentration of a reactant or product per unit time
- B total mass of reactants used in the reaction
- C temperature at which the reaction starts
- D energy released when the reaction finishes

Understand It with Pulse | Flag a mistake

2 **At equilibrium, the concentrations of reactants and products**

- A remain constant, though not necessarily equal
- B are always equal to each other
- C keep changing until the reaction stops
- D are always zero for the reactants

Understand It with Pulse | Flag a mistake

3 **In a saturated solution with excess solid present, the solid is**

- A no longer dissolving at all
- B dissolving and precipitating at equal rates
- C only precipitating
- D only dissolving

Understand It with Pulse | Flag a mistake

4 **Reduction is the process in which a species**

- A loses electrons
- B gains electrons
- C loses protons
- D gains neutrons

Understand It with Pulse | Flag a mistake

5 **A powdered solid reacts faster than a single lump of the same solid because**

- **A** the powder has a larger surface area exposed to the other reactant
- **B** the powder has a lower activation energy
- **C** the lump has more total mass
- **D** the powder contains a catalyst

Understand It with Pulse | Flag a mistake

6 **For $CaCO_3(s) \rightleftharpoons CaO(s) + CO_2(g)$, the equilibrium expression is**

- **A** $K_eq = [CaO][CO_2]$
- **B** $K_eq = \frac{[CaO][CO_2]}{[CaCO_3]}$
- **C** $K_eq = [CO_2]$
- **D** $K_eq = \frac{1}{[CO_2]}$

Understand It with Pulse | Flag a mistake

7 **The K_{sp} of AgCl is 1.8×10^{-10}. Its molar solubility, in mol/L, is about**

- **A** 1.8×10^{-10}
- **B** 3.6×10^{-10}
- **C** 9.0×10^{-11}
- **D** 1.3×10^{-5}

Understand It with Pulse | Flag a mistake

8 **In a redox reaction, the oxidizing agent is the species that**

- **A** is oxidized and causes another species to be reduced
- **B** gains no electrons
- **C** is reduced and causes another species to be oxidized
- **D** loses no electrons

Understand It with Pulse | Flag a mistake

9 **The activation energy of a reaction is the**

- **A** total energy released by the reaction
- **B** energy of the products alone
- **C** average kinetic energy of all particles
- **D** minimum energy colliding particles need to react

Understand It with Pulse | Flag a mistake

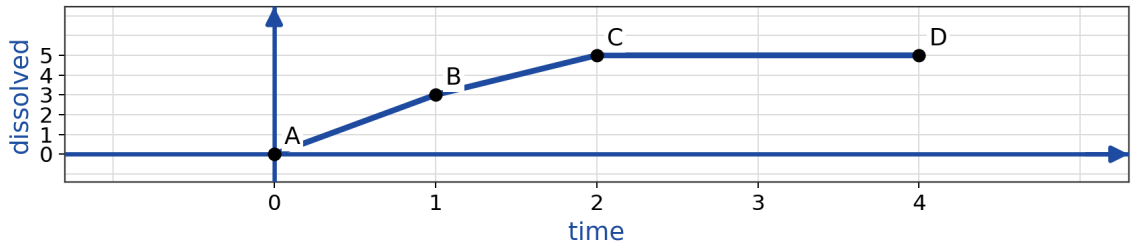
10 **At equilibrium, $[CO] = 0.20$, $[H_2O] = 0.20$, $[CO_2] = 0.40$, and $[H_2] = 0.40$, all in mol/L, for CO + $H_2O \rightleftharpoons CO_2 + H_2$.**
The value of K_eq is

- **A** 1
- **B** 2
- **C** 8
- **D** 4

Understand It with Pulse | Flag a mistake

11

The graph shows the amount of solid dissolved against time. Points are (0, 0), (1, 3), (2, 5), and (4, 5). The flat section shows the solution has become



A dilute

B saturated

C unsaturated

D boiling

Understand It with Pulse

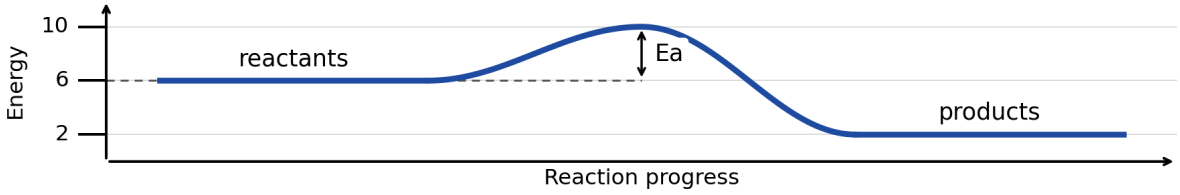
Flag a mistake

12 **In a galvanic cell, reduction occurs at the**

- **A** anode
- **B** cathode
- **C** salt bridge
- **D** wire

Understand It with Pulse | Flag a mistake

13 **The diagram shows the energy profile for a reaction. Reactants are at 6, the peak is at 10, and products are at 2. The activation energy, in the diagram units, is _____**



ANSWER _____

Understand It with Pulse | Flag a mistake

14 For A ⇌ B, an ICE table starts with [A] = 1.00 mol/L and [B] = 0. At equilibrium [B] = 0.20 mol/L. The equilibrium concentration of A, in mol/L, is

- A 0.20
- B 0.40
- C 1.20
- D 0.80

Understand It with Pulse | Flag a mistake

15 A solution with $[H_3O^+] = 1.0 \times 10^{-4}$ mol/L has a pH of

- A 2
- B 10
- C 4
- D 12

Understand It with Pulse | Flag a mistake

16 **A galvanic cell converts**

A chemical energy into electrical energy

B electrical energy into chemical energy

C heat energy into light energy

D mechanical energy into heat

Understand It with Pulse | Flag a mistake

17 **For the reaction A + B → products, the rate law is rate = k[A][B]. Doubling [A] only will**

A double the rate

B quadruple the rate

C halve the rate

D leave the rate unchanged

Understand It with Pulse | Flag a mistake

18 For the system in the previous type of ICE problem, with $[H_2] = 0.20$, $[I_2] = 0.20$, and $[HI] = 0.60$, all in mol/L, K_eq is

- A 3
- B 6
- C 9
- D 15

Understand It with Pulse | Flag a mistake

19 The pH of a 0.020 mol/L NaOH(aq) solution, to the nearest hundredth, is

- A 12.30
- B 11.30
- C 12.70
- D 13.30

Understand It with Pulse | Flag a mistake

20 **Standard reduction potentials are measured relative to the**

- **A** standard zinc electrode
- **B** standard copper electrode
- **C** standard silver electrode
- **D** standard hydrogen electrode

Understand It with Pulse | Flag a mistake

21 **A reaction is zero order with respect to B. Doubling [B] will**

- **A** leave the rate unchanged
- **B** double the rate
- **C** quadruple the rate
- **D** halve the rate

Understand It with Pulse | Flag a mistake

22 **For $N_2 + 3H_2 \rightleftharpoons 2NH_3$ + heat, adding more N_2 at equilibrium will shift the equilibrium to the**

- **A** right, forming more NH_3
- **B** left, forming more N_2
- **C** right, forming more H_2
- **D** left, with no change in NH_3

Understand It with Pulse | Flag a mistake

23 **A 0.10 mol/L solution of a weak acid, HX, has a pH of 3.00. The K_a of HX is approximately**

- **A** 1.0×10^{-3}
- **B** 1.0×10^{-7}
- **C** 1.0×10^{-2}
- **D** 1.0×10^{-5}

Understand It with Pulse | Flag a mistake

24 **Given $E°(Mg^{2+}/Mg) = -2.37$ V and $E°(Ag^{+}/Ag) = +0.80$ V, the cell potential for $Mg + 2Ag^{+} \rightarrow Mg^{2+} + 2Ag$, in volts, is**

A 1.57

B 3.17

C 2.37

D 3.97

Understand It with Pulse | Flag a mistake

25 **Two identical reactions are run, one with a catalyst and one without. The catalyzed reaction has a**

A higher activation energy and a larger enthalpy change

B lower activation energy and more product at equilibrium

C lower activation energy and the same enthalpy change

D higher activation energy and less product

Understand It with Pulse | Flag a mistake

26 **For $N_2 + 3H_2 \rightleftharpoons 2NH_3$, increasing the pressure by decreasing volume will shift the equilibrium toward the side with**

A more moles of gas, the reactant side

B fewer moles of gas, the reactant side

C fewer moles of gas, the product side

D more moles of gas, the product side

Understand It with Pulse | Flag a mistake

27 **For a conjugate acid-base pair, $K_a \times Kb$ equals**

A $Kw = 1.0 \times 10^{-7}$

B $Kw = 1.0 \times 10^{-14}$

C 14.00

D 7.00

Understand It with Pulse | Flag a mistake

28 **In electroplating a spoon with silver, the spoon is the**

A anode

B salt bridge

C cathode

D power supply

Understand It with Pulse | Flag a mistake

29 **As a reaction proceeds, its rate usually decreases because**

A the activation energy rises steadily

B the catalyst is consumed

C reactant concentrations fall, so collisions become less frequent

D the temperature always falls

Understand It with Pulse | Flag a mistake

30 **Which change alters the value of K_eq for a reaction**

A a change in concentration

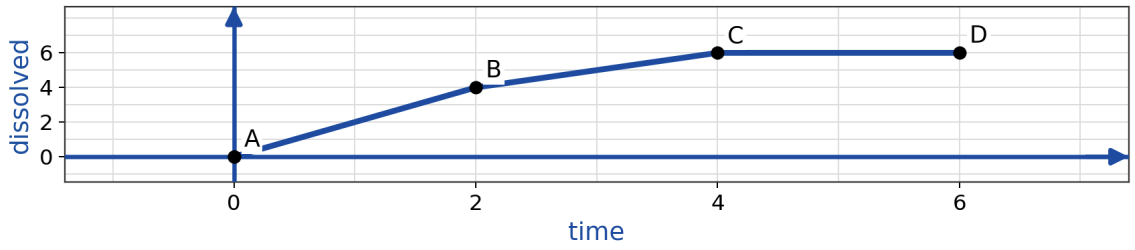
B a change in temperature

C a change in pressure

D adding a catalyst

Understand It with Pulse | Flag a mistake

31 **The graph shows the mass of solid dissolved against time. Points are (0, 0), (2, 4), (4, 6), and (6, 6). The solution first becomes saturated at about**



A 2 minutes

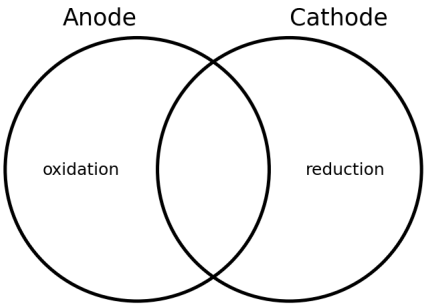
B 6 minutes

C 0 minutes

D 4 minutes

Understand It with Pulse | Flag a mistake

32 **The diagram shows two sets: anodes and cathodes. Which statement belongs in the overlap of both sets**



A oxidation occurs there

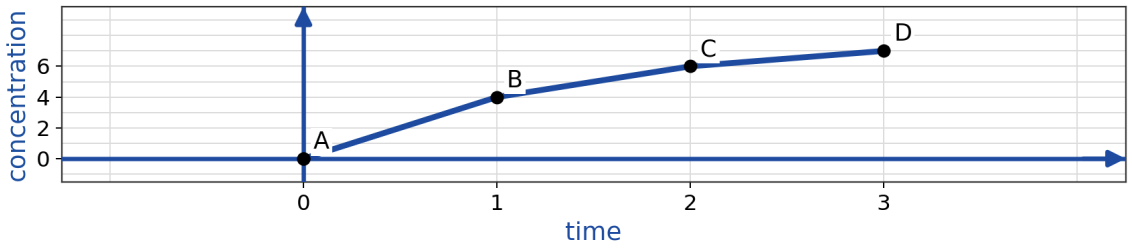
B reduction occurs there

C they are electrodes where a half-reaction occurs

D electrons leave there

Understand It with Pulse | Flag a mistake

33 **The graph shows product concentration against time. Points are (0, 0), (1, 4), (2, 6), and (3, 7). During which time interval is product forming fastest**



A 1 to 2 minutes

B 0 to 1 minute

C 2 to 3 minutes

D The rate is constant

Understand It with Pulse | Flag a mistake

34 **The equilibrium law expression for $CO(g) + H_2O(g) \rightleftharpoons CO_2(g) + H_2(g)$ is**

A $K_eq = \frac{[CO][H_2O]}{[CO_2][H_2]}$

B $K_eq = \frac{[CO_2]}{[CO]}$

C $K_eq = \frac{[CO_2][H_2]}{[CO][H_2O]}$

D $K_eq = [CO_2][H_2]$

Understand It with Pulse | Flag a mistake

35 **A larger K_{sp} for salts of the same type generally means**

A lower solubility

B greater solubility

C a higher pH

D a lower temperature

Understand It with Pulse | Flag a mistake

36 **In the reaction $Mg + 2Ag^{+} \rightarrow Mg^{2+} + 2Ag$, the oxidizing agent is**

A Mg

B Ag^{+}

C Mg^{2+}

D Ag

Understand It with Pulse | Flag a mistake

37 **Which condition gives the fastest reaction between magnesium and acid**

A a magnesium block in cold, dilute acid

B magnesium ribbon in cold, dilute acid

C a magnesium block in warm, dilute acid

D magnesium ribbon in warm, concentrated acid

Understand It with Pulse | Flag a mistake

38 **For X ⇌ Y, with [X] falling from 0.90 to 0.60 mol/L, and [Y] starting at 0, the equilibrium [Y], in mol/L, is**

A 0.10

B 0.60

C 0.90

D 0.30

Understand It with Pulse | Flag a mistake

39 **A solution with pOH 3 has a pH of**

A 3

B 7

C 14

D 11

Understand It with Pulse | Flag a mistake

40 **Given $E°(Mg^{2+}/Mg) = -2.37$ V and $E°(Zn^{2+}/Zn) = -0.76$ V, the cell potential for $Mg + Zn^{2+} \rightarrow Mg^{2+} + Zn$, in volts, is**

A 1.61

B 2.37

C 3.13

D 0.76

Understand It with Pulse | Flag a mistake

41 **The concentration of a reactant falls from 0.60 mol/L to 0.30 mol/L in 15 seconds. The average rate of consumption, in mol/L/s, is**

A 0.020

B 0.010

C 0.030

D 0.040

Understand It with Pulse | Flag a mistake

42 For $2SO_2 + O_2 \rightleftharpoons 2SO_3$, increasing the pressure will shift the equilibrium to the

- A left, toward more moles of gas
- B right, toward fewer moles of gas
- C right, toward more moles of gas
- D left, toward fewer moles of gas

Understand It with Pulse | Flag a mistake

43 Which 0.10 mol/L solution has the highest pH

- A NaOH(aq)
- B HCl(aq)
- C NH_3(aq)
- D CH_3COOH(aq)

Understand It with Pulse | Flag a mistake

44 **In a zinc-copper galvanic cell, the copper electrode**

A loses mass as copper metal is oxidized

B gains mass as copper metal plates onto it

C does not change in mass

D gains mass as zinc plates onto it

Understand It with Pulse | Flag a mistake

45 **Which change increases both the frequency and the energy of collisions**

A adding a catalyst

B grinding a solid reactant

C diluting a solution

D raising the temperature

Understand It with Pulse | Flag a mistake

46 **When a stress is applied to a system at equilibrium, the system shifts to**

- **A** increase the stress further
- **B** stop both reactions
- **C** partially counteract the stress
- **D** change the temperature to zero

Understand It with Pulse | Flag a mistake

47 **The conjugate base of HF(aq) is**

- **A** $F^-(aq)$
- **B** $H_2F^+(aq)$
- **C** $H_3O^+(aq)$
- **D** $OH^-(aq)$

Understand It with Pulse | Flag a mistake

48 **Which equation is a balanced redox half-reaction for the oxidation of aluminium**

- **A** $Al + 3e^- \rightarrow Al^{3+}$
- **B** $Al \rightarrow Al^{3+} + e^-$
- **C** $Al \rightarrow Al^{3+} + 3e^-$
- **D** $Al^{3+} + 3e^- \rightarrow Al$

Understand It with Pulse | Flag a mistake

49 **Stirring a mixture can increase the reaction rate because**

- **A** it lowers the activation energy
- **B** it brings reactant particles into contact more often
- **C** it changes the enthalpy of reaction
- **D** it acts as a catalyst

Understand It with Pulse | Flag a mistake

50

For A + B ⇌ C + D,
if [C] is 0.30, [D] is 0.30, [A] is 0.10, and [B] is 0.10, all in mol/L, K_eq is

A 3

B 6

C 12

D 9

Understand It with Pulse

Flag a mistake

ANSWER KEY

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

© 2026 Brett Robbins. All Rights Reserved.