# NATIONAL EDUCATIONAL ASSESMENT AND EXAMINATIONS AGENCY (NEAEA)
# ETHIOPIAN UNIVERSITY ENTRANCE EXAMINATION (EUEE)
# CHEMISTRY EXAMINTION 2009

*BOOKLET CODE: 00*
*NUMBER OF ITEMS:*

*SUBJECT CODE: 00*
*TIME ALLOWED: 00*

**DIRECTIONS: Each of the following questions is followed by four possible alternatives.**
**You may refer to the information given below when you work on some of the questions.**
**PHYSICAL CONSTANTS:**
**Gas constant, R = 8.314J $mol^{-1}$ $K^{-1}$= 0.0821L - atm $mol^{-1}$**
**Avogadro's number = 6.023 x $10^{23}mol^{-1}$**
**Plank's constant, h = 6.626 x $10^{-34}Js^{-1}$**
**Energy, 1eV = 1.602 x $10^{8}J$**
**Speed of light, c= 2.9979 x $10^{-18}ms^{-1}$**
**Faraday's constant(F) = 96500C$mol^{-1}$e**
**Charge of 1 mole of electrons = 96500C = 1F**
**SI Units and Conversation Factors**
**1ton = 907.185 kg**
**1metic ton = 1000kg**
**1Å = $10^{-10}$m**
**1L-atm = 101.3J**
**Coulombs = amperes x seconds**
**ATOMIC NUMBERS (Z) AND ATOMIC WEIGHTS (A)**

| Element | H | He | Li | B | C | N | O | F | Ne | Na | Mg | P | S | Cl | Ca | Cr | Mn | Fe |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Z | 1 | 2 | 3 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 15 | 16 | 17 | 20 | 24 | 25 | 26 |
| A | 1.0 | 4.1 | 6.9 | 10.8 | 12.0 | 14.0 | 16.0 | 19.0 | 20.2 | 22.98 | 24.31 | 30.97 | 32.1 | 35.5 | 40.1 | 52.0 | 54.9 | 55.9 |

| Element | Co | Ni | Cu | Zn | Ag | Cd | Pt | Au | Hg |
|---|---|---|---|---|---|---|---|---|---|
| Z | 27 | 28 | 29 | 30 | 47 | 48 | 78 | 79 | 80 |
| A | 58.9 | 58.7 | 63.5 | 65.4 | 107.9 | 112.4 | 195.08 | 197.0 | 200.6 |

**1. Which of the following covalent bonds is the most polar?** Not Answered

- A. H - F✔
- B. H - C
- C. H - H
- D. H - N

**2. The force that hold different atoms or ions together are called?** Not Answered

- A. Electric forces
- B. Physical bonds

C. Chemical bond✔

D. Atomic forces

**3. How many electrons are shared between two atoms in a double bond?** Not Answered

A. 2

B. 3

C. 4✔

D. 6

**4. Which of the following is the correct Lewis structure for oxygen atom?** Not Answered

A. Three lone- pairs of valence electrons✔

B. One lone- pair of valence electrons and one bonding site.

C. Two lone- pairs of valence electrons and one bonding site.

D. Two lone- pairs of valence electrons and two bonding sites.

**5. What is the chemical formula of the compound formed by aluminium (III) and sulphate ion, $SO_4^{2-}$ ?** Not Answered

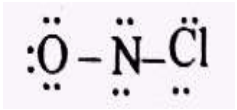
A. $AlSO_4$

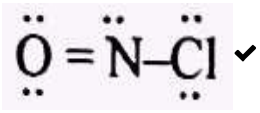
B. $Al_2SO_4$

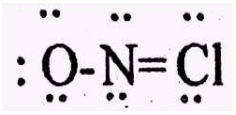
C. $Al_2(SO_4)_3$✔

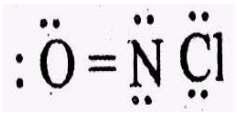
D. $Al(SO_4)_3$

**6. Which of the following is the most reasonable valence- bond structure of the nirocyl chloride (NOCl)?** Not Answered

A. 

B.  ✔

C. 

D. 

**7. What is the ground state electronic configuration of $Cu^{2+}$?** Not Answered

A. [Ar] $4s^t$ $3d^8$

B. [Ar] $4s^2$ $3d^7$✔

C. [Ar] $4s^1$ $3d^{10}$

D. [Ar] $3d^9$

**8. Which of the following is the correct order for electrons filling in orbitals?** Not Answered

A. 3s, 3p, 4s, 3d✔

B. 2p, 3s, 3p, 3d

C. 3p, 4s, 3d, 5s

D. 4s, 3d, 4p, 4d

**9. The normal human eye responds to visible light of wavelength ranging from about 390nm to 710nm. What is the frequency range of the human eye?** Not Answered

- A. 7.7 x $10^{14}s^{-1}$ to 4.2 x $10^{14}$ $s^{-1}$ ✔
- B. 4.2 x $10^{14}s^{-1}$ to 7.7 x $10^{14}$ $s^{-1}$
- C. 1.3 x $10^{-15}s^{-1}$ to 2.4 x $10^{-15}s^{-1}$
- D. 2.4 x $10^{-15}s^{-1}$ to 1.3 x $10^{-15}s^{-1}$

**10. How many different types of orbitals are there in the third energy level?** Not Answered

- A. 2
- B. 3 ✔
- C. 6
- D. 7

**11. The Heisenberg uncertainty principle states that** Not Answered

- A. Two atoms of the same element must have the same number of protons.
- B. No two electrons din the same atom can have the same set of four quantum numbers.
- C. It is impossible to determine both position and momentum of an electron simultaneously. ✔
- D. Electrons of atoms in ground state enter energetically equivalent stet of orbitals singly before they pair any orbitals of the set.

**12. Which of the following transitions will have minimum wavelength?** Not Answered

- A. n4 → n1 ✔
- B. n2 → n1
- C. n4 → n2
- D. n3 → n1

**13. What is the energy associated with one photon of a microwave radiation having a frequency of 2.45 x $10^{9}s^{-1}$?** Not Answered

- A. 1.62 x $10^{24}$J
- B. 2.45 x $10^{9}$J
- C. 2.45 x $10^{-9}$J
- D. 1.62 x $10^{-24}$J ✔

**14. What is the frequency of a radiation (in Hz) from an atom if its wavelength is 1.0 x $10^{-9}$nm?** Not Answered

- A. 3.3 x $10^{-27}$
- B. 3.0 x $10^{17}$
- C. 3.0 x $10^{8}$
- D. 3.0 x $10^{26}$ ✔

**15. Which of the following particle was discovered by the cathode rays experiment?** Not Answered

- A. Electron ✔
- B. Neutron
- C. Nucleus
- D. Proton

**16. Which of the following is NOT a laboratory safety rule?** Not Answered

- A. You should tie back loose hair.

B. You should never add acid to water.✔

C. Do not suck solution in the pipette by mouth.

D. When lighting a Bunsen Burner, you should light the match stick before turning on the gas.

**17. Which of the following are the correct steps of the Scientific Method?** Not Answered

A. Observation- Hypothesis- Experimentation- Formulation of Laws- Theories.

B. Observation- Formulation of Laws- Experimentation- Hypothesis- Theories

C. Observation- Experimentation- Hypothesis- Formulation of Laws- Theories

D. Observation- Experimentation- Formulation of Laws- Hypothesis- Theories✔

**18. Which of the following is the correct relationship between picometer (PM) and nanometer (nm)?** Not Answered

A. 1Pm = 10nm

B. 1pm = 100nm

C. 1nm = 10pm

D. 1nm = 1000pm✔

**19. How many significant figures has the sum of 2.453, 4.6 and 8.14?** Not Answered

A. 2

B. 3✔

C. 4

D. 5

**20. Which one of the following measurements has the greatest number of significant figures?** Not Answered

A. 0.00046

B. 0.0046✔

C. 460

D. $4.6 \times 10^6$

**21. Which of the following methods is used to convert oils into fats?** Not Answered

A. Esterification reaction using strong bases like NaOH or KOH

B. Saponification reaction using strong bases like NaOH or KOH

C. Hydrolysis reaction in the presence of water and a catalyst

D. Hydrogenation reaction at high temperature and in the presence of a catalyst✔

**22. The solubility of compounds containing the carboxylic acid group can be increased by reaction with** Not Answered

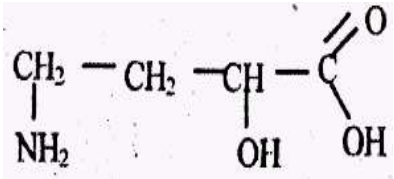
A. Sulphuric acid

B. Sodium hydroxide✔

C. Water

D. Benzoic acid

**23. What is the IUPAC name for the following molecule?**




Not Answered

A. γ - amino - α - hydroxybutyric acid✔

B. 4 - amino - 2 - hydroxybutanoic acid

C. 1 - amino - 3 - hydroxybutanoic acid

D. α - amino - γ - hydroxybutyric acid

**24. What products will be formed when a carboxylic acid reacts with an alcohol?** Not Answered

A. Ketone and water

B. Amide and water

C. Acid chloride and water

D. Easter and water✔

**25. Consider the reaction**
**$AB_3$ (g) ⇌ A (g) + 3B (g)**
**What is the equilibrium constant expression if the initial concentration of $AB_3$, is 0.1M and the equilibrium concentration of A is expressed by x?**
**(Assume the initial concentrations of A and B are both zero.)** Not Answered

A. $\frac{x-3x}{0.1-x}$

B. $\frac{x.3}{(0.1-3x)^3}$

C. $\frac{x-x^3}{(0.1-3x)^3}$

D. $\frac{x(3x)^3}{0.1-x}$ ✔

**26. Consider the following reaction at equilibrium.**
**$2CO_2$ (g) ⇌ 2CO (g) + $O_2$ (g) $\Delta H^0$ = -514KJ**
**What does Le Chatelier's principle predict when the temperature for the reaction is increased?** Not Answered

A. The value of the equilibrium constant will increase.

B. The value of the equilibrium constant will decrease.✔

C. The partial pressure of $O_2$ (g) at equilibrium will increase.

D. The partial pressure of $CO_2$ (g) at equilibrium will increase.

**27. For one component system, when would the degree of freedom becomes one?** Not Answered

A. When only one phase is present.

B. When two phases are present at equilibrium.✔

C. When three phases are present at equilibrium.

D. At all times.

**Use the following equilibrium reaction for questions 29**

**$2C\ (s) + O_2\ (g) = 2CO\ (g)\ \Delta H < 0$**

**29. For the reaction: $2C\ (s) + O_2\ (g) = 2CO\ (g)$ $\Delta H < 0$ if the reaction is at equilibrium with excess C (s) remaining, what change will increase the quantity of CO (g) for the reaction at equilibrium?**

**1) Adding C (s)**

**2) Decreasing the temperature**

**3) Increasing the pressure**

Not Answered

- A. Only 1
- B. Only 2
- C. 1 and 2✔
- D. 2 and 3

**30. Which one of the following is correct when a reaction reaches equilibrium?** Not Answered

- A. The reaction rate for the forward direction is decreased to zero.
- B. The rate of the forward and reverse reaction becomes equal.✔
- C. The rate of the reverse reaction is reached a maximum.
- D. The amounts of reactants and products becomes equal.

**31. A possible mechanism for the reaction, $A + 2B \rightarrow AB_2$ is**

**Step: $A + B \rightarrow AB$ Slow**

**Step: $AB + B \rightarrow AB2$ Fast**

**Overall: $A + 2B \rightarrow AB_2$**

**According to the mechanism, what will be the rate law?** Not Answered

- A. Rate = $K[A][B]$✔
- B. Rate = $K[B]^2$
- C. Rate = $K[A][B]^2$
- D. Rate = $K[A]$

**32. The initial rate of a reaction $A + B \rightarrow$ products was measured for several different starting concentrations of A and B, with the following results.**

| Exp | [A] | [B] | Initial rate of formation of C M/s |
|---|---|---|---|
| 1 | 0.04 | 0.04 | $9.6 \times 10^{-6}$ |
| 2 | 0.08 | 0.04 | $1.92 \times 10^{-5}$ |
| 3 | 0.02 | 0.02 | $9.6 \times 10^{-6}$ |

**What is the initial rate of reaction when $[A]_0 = 0.12M$ and $[B]_0 = 0.015M$?** Not Answered

- A. $0.006 Ms^{-1}$
- B. $0.006 M^{-2}s^{-1}$
- C. $1.08 \times 10^{-5} Ms^{-1}$✔
- D. $1.08 \times 10^{-4} Ms^{-1}$

**33. Given the following data for the reaction:**

**$NH_4^+(aq) + NO_2^-(aq) \rightarrow N_2(g) + 2H_2O(l)$**

| Experiment | $[N_4^+]$ | $[N_2^-]$ | Rate |
|---|---|---|---|
| 1 | 0.010M | 0.020M | 0.020M/s |
| 2 | 0.015M | 0.020M | 0.03M/s |
| 3 | 0.010M | 0.010M | 0.005M/s |

**What will be the rate law for the given reaction?** Not Answered

- A. Rate = $K[NH_4^+][NO_2^-]$
- B. Rate = $K[NH_4^+]^2[NO_2]$
- C. Rate = $K[NH_4^+]^2[NO_2^-]^2$
- D. Rate = $K[NH_4^+][NO_2^-]^2$ ✔

**34. The rate of a reaction increases with increasing the concentration of reactant molecules, because** Not Answered

- A. The average kinetic energy of the molecules increases.
- B. The frequency of molecular collisions increase. ✔
- C. The order of the reaction increases
- D. The activation energy increases.

**35. Consider the following reactions:**

**$2N_2O_5(g) \rightarrow 4NO_2(g) + O_2(g)$**

**At a certain temperature, the rate of decomposition of $N_2O_5(g)$ is 2.5 x $10^6$mol/s. What will be the rate of formation of $NO_2$?**

Not Answered

- A. 1.0 x 10-5mol/s
- B. 2.5 x 10-6mol/s
- C. 1.3 x 10-6mol/s
- D. 5.0 x 10-6mol/s ✔

**36. Which of the following refer to a reaction that is NOT dependent on the concentration of a reactant?** Not Answered

- A. Second order reaction
- B. First order reaction
- C. Zero order reaction ✔
- D. Third order reaction

**37. What is (are) the F-S-F bond angle(s) in $SF_6$?** Not Answered

- A. $109.5^0$
- B. $120^0$
- C. $90^0$ and $120^0$ ✔
- D. $90^0$ and $180^0$

**38. What is the bond order of a superoxide anion, with the chemical formula $O_2^-$?** Not Answered

- A. 3
- B. 2.5
- C. 2
- D. 1.5 ✔

**39. What kind of hybrid orbitals are utilized by the carbon atom in $CF_4$ molecules?** Not Answered

A. Sp

B. $Sp^2$

C. $Sp^3$ ✔

D. $Sp^3d$

**40. Which of the following molecule is INCORRECTLY matched with the electronic geometry of the central atom?** Not Answered

A. $CF_4$: tetrahedral

B. $H_2O$: tetrahedral ✔

C. $CF_4$: Pyramidal

D. $BeBr_2$: linear

**41. A 0.217g sample of HgO reacts with excess iodide ions according to the reaction:**
**$HgO + 4I^- + H_2O \rightarrow HgI_4^{2-} + 2OH^-$**
**How many ml, of 0.1M HCl is required to reach equilibrium point during the titration of the solution?** Not Answered

A. 1.0

B. 10 ✔

C. 20

D. 50

**42. Which statement about indicators is always correct?** Not Answered

A. The mid-point of the PH rage of an indicator is 7.0

B. The PH rage is greater with higher PKa values.

C. The colour red indicates an acidic solution.

D. The PKa values of the indicator is within its PH range. ✔

**43. To a 50.0ml of a buffer solution that is 0.25M in HF and 0.10M in NaF, if 5.0ml of 0.050M NaOH is added, what is the final PH of this buffer solution? Given the pKaHF = 3.17** Not Answered

A. 2.77 ✔

B. 2.8

C. 2.74

D. 3.17

**44. The suppression of ionization of a weak acid or a weak base by adding one of its own ions is known as:** Not Answered

A. Buffer effect

B. Ionization effect

C. Common ion effect ✔

D. Association effect

**45. Nitrous acid, $HNO_2$ is 0.37% ionized in 3.0M solution. What is the $K_a$ for this acid?** Not Answered

A. $\frac{3.0(0.0037)^2}{99.63}$

B. $\frac{(0.0037)^2}{0.9963}$

C. $\frac{3.0(0.0037)^2}{0.9963}$ ✔

D. $\frac{0.9963}{(0.0037)^2}$

**46. Among the following acids, which has the lowest $PK_a$ value?** Not Answered

A. $CH_3CH_2COOH$

B. HCOOH✔

C. $(CH_3)2CHCOOH$

D. $CH_3COOH$

**47. Which one of the following is a Lewis acid?** Not Answered

A. $NH_3$

B. $CCl_4$

C. $AlCl_3$✔

D. LiCl

**48. Which of the following is the conjugate acid of the $HS^-$ion?** Not Answered

A. $H_2S^-$

B. $S_2^-$

C. $S^-$

D. $H^2S$✔

**49. What will be the ration of the boiling point elevation of a 0.1M solution of sucrose, sodium sulphate and potassium bromide?** Not Answered

A. 1 : 3 : 1

B. 1 : 1 : 2

C. 1: 3 : 2✔

D. 1 : 2 : 2

**50. When the molecular equation: $CaCl_2(aq) + Na_2CO_3(aq) \rightarrow CaCO3(s) + 2NaCl(aq)$**
**Is written in terms of ionic equation, which one of the following pairs will be the spectator ions?** Not Answered

A. $Na^+$ and $Cl^-$✔

B. $Ca^{2+}$ and $Cl^-$

C. $Na_3^{2-}$ and $Cl^-$

D. $Ca^{2+}$ and $CO_3^{2-}$

**51. If 0.454kg of nitroglycerin explodes according to the following reaction:**
**$2C_3H_5(NO_2)_3 \rightarrow 6CO_2 + 3N_2 + 5H_2$**
**What is the total volume of gases in $dm^3$ produced at STP?** Not Answered

A. 44.8

B. 163

C.397.7✔

D. 650

**52. How many grams of methanol would have to be added to water to prepare 150ml of solution which is 2.0M methanol?**
Not Answered

- A. 2.4
- B. 9.6✔
- C. 9.6 x $10^3$
- D. 4.3 x $10^2$

**53. A certain 500g toothpaste sample has 0.2g of fluoride. What is the concentration of the fluoride in ppm?** Not Answered

- A. 200
- B. 250
- C. 400✔
- D. 1000

**54. What will be the normality of a 2.3M sulphuric acid solution?** Not Answered

- A. 0.23N
- B. 0.46N
- C. 2.3N
- D. 4.6N✔

**55. The solubility of NaCl in water at $20^0$C is 36g in 100g of water. A solution that contains 18g of NaCl in 50g of water at $20^0$C is** Not Answered

- A. Saturated✔
- B. Unsaturated
- C. Supersaturated
- D. Dilute

**56. Which of the following will increase the rate at which a solid dissolves in a liquid?** Not Answered

- A. Supersaturating the solution✔
- B. Grinding the solid into smaller pieces
- C. Lowering the temperature of the solvent
- D. Placing the solution in opaque container

**57. Which of the following pairs of substances are miscible?** Not Answered

- A. Water and gasoline
- B. Water and oxygen
- C. Water and salt
- D. Water and ethanol✔

**58. Which of the following types of solution are possible?**
**1. Solid dissolved in a liquid**
**2. Gas dissolved in a gas**
**3. Gas dissolved in a liquid**
**4. Solid dissolved in a solid**
Not Answered

- A. 1 and 2
- B. 1, 2, 3 and 4 ✔
- C. 1, 2 and 4

D. 1

**59. The chemical makeup of oil is esters of glycerol with three** Not Answered

A. Identical saturated fatty acids.
B. Predominantly saturated fatty acids.
C. Predominantly unsaturated fatty acids.✔
D. Identical unsaturated fatty acids.

**60. Which of the following general class of organic molecules do triglycerides belong to?** Not Answered

A. Ketones
B. Carboxylic acids
C. Esters✔
D. Ethers

**61. What type of polymerization occurs when amino acids react to form peptides and proteins?** Not Answered

A. Addition polymerization
B. Condensation polymerization ✔
C. Substitution polymerization
D. Hydration polymerization

**62. Which of the following is the most abundant polysaccharide?** Not Answered

A. Amylose
B. Cellulose✔
C. Starch
D. Sucrose

**63. What is the other name for polymethyl methacrylate (PMMA)?** Not Answered

A. Perspex✔
B. Teflon
C. Bakelite
D. Nylon- 6

**64. What is the monomer of polyvinyl chloride (PVC)?** Not Answered

A. Cloroethane
B. Ethylene dichloride✔
C. Chloroform
D. Ethyl chloride

**65. The second step in the production of sulphuric acid is given by the reaction:**
**$2SO_2(g) + O_2(g) \leftrightarrows 2SO_3(g)$**
**Which conditions would increase the yield of this reaction?** Not Answered

A. High temperature and low pressure
B. Low temperature and high pressure✔
C. High temperature and high pressure
D. Low temperature and low pressure

**66. Which of the following reactions is used in the production of industrially important chemical?** Not Answered

A. $H_2S_2O_7(l) + H_2O(l) \rightarrow 2H_2SO_4(aq)$✔

B. $3NO_3(g) + H_2O(l) \rightarrow 2HNO_3(aq) + NO_2(g)$

C. $(NH_4)2HPO_4(s) + NH_3(g) \rightarrow NH_4H_2PO_4(s)$

D. $2Cr(s) + Al_2O_3(s) \rightarrow Cr_2O_3(s) + 2Al(s)$

**67. Which one of the following metal is used for galvanization of iron sheets?** Not Answered

A. Nickel

B. Zinc✔

C. Chromium

D. Aluminium

**68. In what way is the phosphorous cycle differs from the carbon and nitrogen cycle?** Not Answered

A. Phosphorus is more abundant than carbon and nitrogen

B. Phosphorus is less important than carbon and nitrogen

C. Phosphorus, once used by an organism does not cycle back to the environment

D. The reservoirs for phosphorus exists in mineral form in rocks than in the atmosphere✔

**69. Which one of the following is needed for photosynthesis?** Not Answered

A. Carbon dioxide✔

B. Nitrogen

C. Oxygen

D. Phosphorus

**70. Consider the reaction:**
**$Cu^{2+}(aq) + Fe(s) \rightleftharpoons Cu(s) + Fe^{2+}(aq)$, E0 = 0.78V**
**What is the value of E when $[Cu^{2+}]$ is equal to 0.040M and $[Fe^{2+}]$ is equal to 0.40M?** Not Answered

A. 0.72V

B. 0.75V✔

C. 0.81V

D. 0.84V

**71. For the electrochemical cell represented by:**
**$Zn/ZnSO_4(aq)$ // $CuSO_4(aq)/Cu(s)$**
**The standard reduction potentials for $Cu^{2+}/Cu$ and $Zn^{2+}/Zn$ are +0.34 and -0.76V, respectively, what will be the cell reaction that occurs spontaneously and its cell voltage?** Not Answered

A. $Cu + Zn^{2+} = Cu^{2+} + Zn$ $E^0(V) = 1.10$

B. $Zn + Cu^{2+} = Zn^{2+} + Cu$ $E^0(V) = 0.42$

C. $Cu^{2+} + Zn^{2+} = Zn + Cu$ $E^0(V) = 0.42$

C. $Cu^{2+} + Zn = Cu + Zn^{2+}$ $E^0(V) = 1.10$✔

**72. What product(s) is /are formed during the electrolysis of a concentrated aqueous solution of sodium chloride?** Not Answered

A. $Cl_2(g)$

B. $Cl_2(g)$ and $H_2(g)$

C. NaOH(aq) and $Cl_2(g)$

D. $Cl_2(g)$, $H_2(g)$ and NaOH(aq)✔

**73. In the reaction:**
**$Pb+(s), PbO_2 + H_2SO_4(aq) \rightarrow 2PbSO_4(s) + 2H_2O(l)$**
**Which substance behaves as the oxidizing agent?** Not Answered

- A. Pb
- B. $PbSO_4$
- C. $PbO_2$ ✔
- D. $H_2SO_4$

**74. What mass of magnesium (Mg) is produced in the electrolysis of molten $MgCl_2$, if a current of $7.50 \times 10^2$ A is passed through the molten salt for 1.00 hour?** Not Answered

- A. $3.4 \times 10^2$g ✔
- B. $9.92 \times 10^2$g
- C. $1.7 \times 10^2$g
- D. $4.96 \times 10^2$g

**75. Devices in which oxidation- reduction reaction is induced by an electric current are called** Not Answered

- A. Galvanic cells
- B. Electrolytic cells ✔
- C. Voltaic cells
- D. Electromotive cells

**76. In the following reaction:**
**$3Cl^-(aq) + 4CrO_4^{2-}(aq) + 23H^+(aq) \rightarrow 3HClO_2(aq) + 4Cr^{3+}(aq) + 10H_2O(l)$**
**What is the behaviour $Cl^-$ (aq)?** Not Answered

- A. An acid
- B. A base
- C. An oxidizing agent
- D. A reducing agent ✔

**77. The KP for the reaction: $2SO_3(g) \rightleftharpoons 2SO_2(g) + O_2(g)$ is 0.26 at $1{,}000^0$C and 40.8 at $1{,}300^0$C, which of the following combinations of ΔH and ΔS are most plausible for the reaction at these temperatures?**

| | ΔH | ΔS | Not Answered |
|---|---|---|---|
| A. | >0 | <0 ✔ | |
| B. | >0 | >0 | |
| C. | <0 | >0 | |
| D. | <0 | <0 | |

**78. Based on the following information**

| | $\Delta H^0$(KJ) |
|---|---|
| $H_2(g) + 1/2O_2(g) \rightarrow H_2O(l)$ | -286 |
| $2Na(s) + 1/2O_2(g) \rightarrow Na_2O(s)$ | 414 |
| $Na(s) + 1/2O_2(g) + 1/2H_2(g) \rightarrow NaOH(s)$ | -425 |

**What will be the standard enthalpy changes for the reaction?**
**$Na_2O(s) + H_2O(l) \rightarrow 2NaOH(s)$?** Not Answered

- A. -978KJ
- B. -722KJ
- C. -150KJ ✔

D. +275KJ

**79. At what condition(s) is the equation, ΔH = ΔU + PΔV, applicable?** Not Answered

A. For constant pressure and temperature processes
B. Only for constant pressure processes✔
C. Only for constant temperature processes
D. Only for constant volume processes

**80. What is a thermodynamic system that exchanges both energy and matter with the surroundings?** Not Answered

A. Adiabatic
B. Closed
C. Isolated
D. Open ✔

**Use the following equilibrium reaction for questions 81**
**$2C\ (s) + O_2\ (g) = 2CO\ (g)$ ΔH < 0**
**81. What is the equilibrium expression? (M)** Not Answered

A. $K = \frac{2[CO]}{2[C]+[O_2]}$
B. $K = \frac{[CO]^2}{[C]^2[O_2]}h$
C. $K = \frac{2[CO]}{[O_2]}$
D. $K = \frac{[CO]^2}{[O_2]}$ ✔

## Your Answers

you have scored 0 out of 0

## Answer Key

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1.A | 11.C | 21.D | 31.C | 41.D | 51.B | 61.B | 71.D |
| 2.C | 12.A | 22.B | 32.D | 42.A | 52.C | 62.A | 72.C |
| 3.C | 13.D | 23.A | 33.B | 43.C | 53.D | 63.B | 73.A |
| 4.A | 14.D | 24.D | 34.D | 44.C | 54.A | 64.B | 74.B |
| 5.C | 15.A | 25.D | 35.C | 45.B | 55.A | 65.A | 75.D |
| 6.B | 16.B | 26.B | 36.C | 46.C | 56.D | 66.B | 76.A |
| 7.B | 17.D | 27.B | 37.D | 47.D | 57.B | 67.D | 77.C |
| 8.A | 18.D | 28.C | 38.C | 48.C | 58.C | 68.A | 78.B |
| 9.A | 19.B | 29.B | 39.B | 49.A | 59.C | 69.B | 79.D |
| 10.B | 20.B | 30.A | 40.B | 50.C | 60.B | 70.D | 80.D |

Retake Exam (exam.php?subject=Chemistry&year=2009)