

## QAD Series

## Inorganic Chemistry - I

- According to modern periodic law, the chemical properties of elements are the periodic function of their:
  - density
  - atomic number
  - mass number
  - atomic mass
- Element with atomic number 56 belong to which block?
  - s
  - p
  - d
  - f
- The element with the highest first ionization potential is:
  - boron
  - carbon
  - nitrogen
  - oxygen
- First of all the elements were classified by
  - Lothar Meyer
  - Newland
  - Mendeleev
  - Dobereiner
- Which of the following pairs violated periodic law by atomic mass?
  - Co and Ni
  - Fe and Co
  - Na and K
  - All
- Which of the following is not a Dobereiner triad?
  - Cl, Br, I
  - Ca, Sr, Ba
  - Li, Na, K
  - Fe, Co, Ni
- Which of the following order is incorrect?
  - Acidic:  $\text{NH}_3 < \text{PH}_3 < \text{AsH}_3$
  - $\text{IE}_1$ :  $\text{Li} < \text{Be} < \text{B} < \text{C}$
  - Basic:  $\text{Al}_2\text{O}_3 < \text{MgO} < \text{Na}_2\text{O} < \text{K}_2\text{O}$
  - Ionic radius:  $\text{Li}^+ < \text{Na}^+ < \text{K}^+ < \text{Cs}^+$
- In the long form of periodic table, the elements having lowest ionization potential are placed in
  - I group
  - IV group
  - VII group
  - zero group
- Correct increasing order of density is:
  - $\text{Li} < \text{K} < \text{Na} < \text{Rb} < \text{Cs}$
  - $\text{Li} < \text{Na} < \text{K} < \text{Rb} < \text{Cs}$
  - $\text{Cs} < \text{Rb} < \text{K} < \text{Na} < \text{Li}$
  - $\text{K} < \text{Li} < \text{Na} < \text{Rb} < \text{Cs}$
- Which of the following is paramagnetic?
  - $\text{O}_2^-$
  - $\text{CN}^-$
  - CO
  - $\text{NO}^+$
- As we move along the periodic table from left to right, the atomic size decreases. However, noble gases have the largest size because of
  - covalent radii
  - ionic radii
  - Van der Waal's radii
  - stable octet
- Which sets of ions represents the collection of isoelectronic species?
  - $\text{Na}^+, \text{Mg}^{2+}, \text{Al}^{3+}, \text{Cl}^-$
  - $\text{Na}^+, \text{Ca}^{2+}, \text{Sc}^{3+}, \text{F}^-$
  - $\text{K}^+, \text{Cl}^-, \text{Mg}^{2+}, \text{S}^{2-}$
  - $\text{K}^+, \text{Ca}^{2+}, \text{Sc}^{3+}, \text{Cl}^-$
- Which are attracted in magnetic field?
  - Co salt
  - Zn salt
  - Ba salt
  - None
- The alkaline earth metals Ba, Sr, Ca and Mg may be arranged in the order of their decreasing first ionization potential as:
  - Mg, Ca, Sr, Ba
  - Ca, Sr, Ba, Mg
  - Sr, Ba, Mg, Ca
  - Ba, Mg, Ca, Sr
- Which arrangement for the three halogens Cl, Br and I is correct in the order of their increasing electron affinity?
  - Cl, Br, I
  - I, Br, Cl
  - Br, Cl, I
  - I, Cl, Br
- Which is not arranged in the correct sequence?
  - $d^5, d^3, d^1, d^4$ -increasing magnetic moment
  - MO,  $\text{M}_2\text{O}_3$ ,  $\text{MO}_2$ ,  $\text{M}_2\text{O}_5$ -decreasing basic strength
  - Sc, V, Cr, Mn-increasing number of oxidation states
  - $\text{Co}^{2+}, \text{Fe}^{3+}, \text{Sc}^{3+}$ -increasing stability
- The lowest ionization energy would be associated with the electronic structure:
  - $1s^2, 2s^2 2p^6, 3s^1$
  - $1s^2, 2s^2 2p^5$
  - $1s^2, 2s^2 2p^6$
  - $1s^2, 2s^2 2p^6, 3s^2$
- Which transition involves maximum amount of energy?
  - $\text{M}^-(g) \rightarrow \text{M}(g) + e$
  - $\text{M}^-(g) \rightarrow \text{M}^+(g) + 2e$
  - $\text{M}^+(g) \rightarrow \text{M}^{2+}(g) + e$
  - $\text{M}^{2+}(g) \rightarrow \text{M}^{3+}(g) + e$
- Among the following ions which one has the highest paramagnetism?
  - $[\text{Cr}(\text{H}_2\text{O})_6]^{3+}$
  - $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$
  - $[\text{Cu}(\text{H}_2\text{O})_6]^{2+}$
  - $[\text{Zn}(\text{H}_2\text{O})_6]^{2+}$
- Ionic radii of:
  - $\text{Ti}^{4+} < \text{Mn}^{2+}$
  - $\text{Co}^{3+} > \text{Fe}^{2+}$
  - $\text{K}^+ > \text{Cl}^-$
  - $\text{P}^{3+} > \text{P}^{5+}$
- The process requiring the absorption of energy is
  - $\text{F} \rightarrow \text{F}^-$
  - $\text{H} \rightarrow \text{H}^-$
  - $\text{Cl} \rightarrow \text{Cl}^-$
  - $\text{N} \rightarrow \text{N}^-$
- The correct order of radii is
  - $\text{N} < \text{Be} < \text{B}$
  - $\text{F}^- < \text{O}^{2-} < \text{N}^{3-}$
  - $\text{Na} < \text{Li} < \text{K}$
  - $\text{Fe}^{3+} < \text{Fe}^{2+} < \text{Fe}$
- Among O, C, F, Cl, Br the correct order of increasing atomic radii is:
  - $\text{F} < \text{O} < \text{C} < \text{Cl} < \text{Br}$
  - $\text{F} < \text{C} < \text{O} < \text{Br} < \text{Cl}$
  - $\text{F} < \text{Cl} < \text{Br} < \text{O} < \text{C}$
  - $\text{C} < \text{O} < \text{F} < \text{Cl} < \text{Br}$
- Hydrogen peroxide is now generally prepared on industrial scale by the
  - action of  $\text{H}_2\text{SO}_4$  on barium peroxide
  - action of  $\text{H}_2\text{SO}_4$  on sodium peroxide
  - electrolysis of 50%  $\text{H}_2\text{SO}_4$
  - burning hydrogen in excess of oxygen
- The formula of heavy water is
  - $\text{H}_2\text{O}^{18}$
  - $\text{D}_2\text{O}$
  - $\text{T}_2\text{O}$
  - $\text{H}_2\text{O}^{17}$
- The species that does not contain peroxide ions is
  - $\text{PbO}_2$
  - $\text{H}_2\text{O}_2$
  - $\text{SrO}_2$
  - $\text{BaO}_2$
- Which does not cause hardness of water?
  - $\text{CaCl}_2$
  - $\text{MgSO}_4$
  - $\text{Na}_2\text{SO}_4$
  - $\text{CaSO}_4$
- Hydrogen is evolved by the action of cold dilute  $\text{HNO}_3$  on
  - Fe
  - Mg or Mn
  - Cu
  - Al
- In Bosch's process which gas is utilized for production of hydrogen gas?
  - Producer gas
  - Water gas
  - Coal gas
  - None of these
- Ordinary  $\text{H}_2$  is a mixture of \_\_\_\_\_ forms of  $\text{H}_2$ .
  - 1
  - 2
  - 3
  - 4
- When hydrolith is treated with water it yields
  - $\text{H}_2$
  - $\text{H}_2\text{O}_2$
  - $\text{N}_2$
  - NaH
- The geometry of water molecule is same as that of
  - $\text{CO}_2$
  - $\text{C}_2\text{H}_4$
  - Chlorine oxide
  - Boron trifluoride
- Tendency of catenation is strongest in
  - C
  - O
  - N
  - Si
- Carbon burns in air and forms two oxides CO and  $\text{CO}_2$ . This shows that carbon has:
  - two allotropic forms
  - two oxidation states
  - two isotopes
  - 4 electrons in valency shell
- Carbon dioxide is a gas but silica is a solid because:
  - carbon dioxide is composed of discrete covalent  $\text{CO}_2$  molecules whereas silica has continuous tetrahedral structure
  - $\text{CO}_2$  molecules are lighter than  $\text{SiO}_2$  molecules
  - $\text{CO}_2$  is more acidic than  $\text{SiO}_2$
  - melting point of silica is very high
- The anhydride of carbonic acid  $\text{H}_2\text{CO}_3$  is
  - $\text{C}_2\text{O}_2$
  - $\text{CO}_2$
  - CO
  - $\text{Na}_2\text{CO}_3$
- The main constituents of coal gas are:
  - $\text{CH}_4 + \text{CO} + \text{H}_2$
  - $\text{CO}_2 + \text{CO} + \text{H}_2$
  - $\text{CO} + \text{CO}_2$
  - $\text{CO} + \text{N}_2$
- The acid used for etching the glass is
  - sulphuric acid
  - perchloric acid
  - hydrofluoric acid
  - aqua-regia
- Which is used for the manufacture of optical instrumentals?
  - Water glass
  - Pyrex glass
  - Flint glass
  - Jena glass
- Which statement is correct with respect to the property of the elements with increase in atomic number in the carbon family?
  - Their metallic character decreases
  - The stability of +2 oxidation state increases
  - Their ionization energy increases
  - Their atomic size decreases
- Colloidal solution of graphite in water is called
  - oiddag
  - aquadag
  - lamp black
  - none
- Which of the following is methanide?
  - $\text{Be}_2\text{C}$
  - $\text{Al}_4\text{C}_3$
  - $\text{Mn}_3\text{C}$
  - All
- The inert form of carbon is
  - diamond
  - graphite
  - coal
  - charcoal
- Which statement is false?
  - 
  - 
  - 
  -

- a) Water gas is a mixture of hydrogen and carbon monoxide  
 b) Producer gas is a mixture of carbon monoxide & nitrogen  
 c) Water gas is a mixture of water vapour and hydrogen  
 d) Natural gas consists of methane, ethane and gaseous hydrocarbons
45. Newly shaped glass articles when cooled suddenly become brittle, therefore these are cooled slowly, this process is known as  
 a) tempering b) annealing c) quenching d) galvanising
46. CO<sub>2</sub> and N<sub>2</sub> are non-supporters of combustion. However, for putting out fires CO<sub>2</sub> is preferred over N<sub>2</sub> because CO<sub>2</sub>  
 a) does not burn  
 b) forms non combustible products with burning substance  
 c) is denser than nitrogen  
 d) is a more than nitrogen
47. Sesquioxide of lead is  
 a) PbO b) PbO<sub>2</sub> c) Pb<sub>2</sub>O d) Pb<sub>2</sub>O<sub>3</sub>
48. The correct order of decreasing ionic nature of lead dihalides is  
 a) PbF<sub>2</sub> > PbCl<sub>2</sub> > PbBr<sub>2</sub> > PbI<sub>2</sub>  
 b) PbF<sub>2</sub> > PbBr<sub>2</sub> > PbCl<sub>2</sub> > PbI<sub>2</sub>  
 c) PbF<sub>2</sub> < PbCl<sub>2</sub> > PbBr<sub>2</sub> < PbI<sub>2</sub>  
 d) PbF<sub>2</sub> < PbBr<sub>2</sub> < PbCl<sub>2</sub> < PbI<sub>2</sub>
49. Thermodynamically most stable form of carbon is  
 a) diamond b) coke c) charcoal d) graphite
50. Oxygen molecule is  
 a) paramagnetic b) diamagnetic  
 c) ferromagnetic d) ferrimagnetic
51. Ozone reacts with dry iodine to give  
 a) IO<sub>2</sub> b) I<sub>2</sub>O<sub>3</sub> c) I<sub>2</sub>O<sub>4</sub> d) I<sub>4</sub>O<sub>6</sub>
52. Ozone turns benzidine paper  
 a) Violet b) Brown c) Blue d) Red
53. When SO<sub>2</sub> gas is passed through an acidified solution of K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>:  
 a) the solution becomes blue  
 b) the solution becomes colourless  
 c) SO<sub>2</sub> is reduced  
 d) green Cr<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> is formed
54. Starch paper moistened with KI solution turns blue in ozone because of  
 a) iodine liberation b) oxygen liberation  
 c) alkali formation  
 d) ozone reacts with litmus paper
55. Most abundant element in earth crust is  
 a) O b) Se c) S d) Te
56. On passing H<sub>2</sub>S through acidified FeCl<sub>3</sub> solution, FeCl<sub>3</sub> is converted into:  
 a) FeCl<sub>2</sub> b) Fe<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> c) FeS d) FeSO<sub>4</sub>
57. Which element shows polymorphism?  
 a) O b) S c) Se d) all
58. Which gives off oxygen on moderate heating?  
 a) Cupric oxide b) Mercuric oxide  
 c) Zinc oxide d) Aluminium oxide
59. S - S bond is not present in  
 a) S<sub>2</sub>O<sub>7</sub><sup>2-</sup> b) S<sub>4</sub>O<sub>6</sub><sup>2-</sup> c) S<sub>2</sub>O<sub>4</sub><sup>2-</sup> d) S<sub>2</sub>O<sub>3</sub><sup>2-</sup>
60. Bond angle is minimum in  
 a) H<sub>2</sub>O b) H<sub>2</sub>S c) H<sub>2</sub>Se d) H<sub>2</sub>Te
61. Hypo is used in photography to  
 a) reduce AgBr grains to metallic Ag  
 b) convert metallic Ag to silver salt  
 c) remove undecomposed AgBr as soluble complex  
 d) remove reduced Ag
63. Which of the following has ππ\*-dπ bonding?  
 a) NO<sub>3</sub><sup>-</sup> b) SO<sub>3</sub><sup>2-</sup> c) BO<sub>3</sub><sup>3-</sup> d) CO<sub>3</sub><sup>2-</sup>
64. Which one is responsible for depletion of ozone layer in the upper strata of the atmosphere?  
 a) Polyhalogens b) Ferrocene  
 c) Fullerenes d) Freons
65. Oxalic acid on dehydration by conc. H<sub>2</sub>SO<sub>4</sub> gives  
 a) C + CO<sub>2</sub> b) CO c) CO<sub>2</sub> d) CO + CO<sub>2</sub>
66. H<sub>2</sub>S does not produce metallic sulphide with  
 a) CaCl<sub>2</sub> b) ZnCl<sub>2</sub> c) COCl<sub>2</sub> d) CuCl<sub>2</sub>
67. Aqueous solution of Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> on reaction with Cl<sub>2</sub> gives  
 a) Na<sub>2</sub>S<sub>4</sub>O<sub>6</sub> b) NaHSO<sub>4</sub> c) NaCl d) NaOH
68. Which of the following has highest b. pt.?
- a) H<sub>2</sub>O b) HI c) NH<sub>3</sub> d) HF
69. The 1<sup>st</sup> IE of the elements of the transition series  
 a) increases as the atomic no. increase  
 b) decrease as the atomic no. increase  
 c) do not show any change as the addition of electron takes place in the inner (n-1)d - orbital  
 d) none
70. Which of the following shows diagonal relationship?  
 a) B, Al b) Be, Al c) Zr, Hf d) K, Rb
71. The elements with zero electrons affinity are  
 a) Boron and carbon b) Beryllium and helium  
 c) Lithium and Sodium d) Fluorine and chlorine
72. Bucky ball or Buckminster fullerene is:  
 a) an allotrope of carbon  
 b) it is referred as C-60  
 c) it has sp<sup>2</sup> hybridised nature and resembles with soccer ball  
 d) all
73. CO forms a volatile compound with:  
 a) Ni b) Cu c) Al d) Si
74. Bleaching powder on treatment with CO<sub>2</sub> gives:  
 a) O<sub>2</sub> b) Cl<sub>2</sub> c) HCl d) H<sub>2</sub>
75. The wrong statement about ammonia is:  
 a) NH<sub>3</sub> is oxidized with oxygen at 700°C in the presence of platinum  
 b) NH<sub>3</sub> gives black precipitate with calomel  
 c) NH<sub>3</sub> can be dried by P<sub>2</sub>O<sub>5</sub>, H<sub>2</sub>SO<sub>4</sub> and CaCl<sub>2</sub>  
 d) NH<sub>3</sub> gives white fumes with HCl
76. Which of the following halides is the most acidic?  
 a) PCl<sub>3</sub> b) SbCl<sub>3</sub> c) BiCl<sub>3</sub> d) CCl<sub>4</sub>
77. Nitric acid on standing develops brownish colour which may be attributed to the presence of:  
 a) NO<sub>2</sub><sup>+</sup> ions b) NO<sub>3</sub><sup>-</sup> ions c) NO<sub>2</sub> d) HNO<sub>2</sub>
78. Mixture used in Holme's signal is:  
 a) CaCl<sub>2</sub> + CaC<sub>2</sub> b) CaCl<sub>2</sub> + Ca<sub>3</sub>P<sub>2</sub>  
 c) Ca<sub>3</sub>N<sub>2</sub> + CaC<sub>2</sub> d) Ca<sub>3</sub>P<sub>2</sub> + CaC<sub>2</sub>
79. Platinised asbestos used as a catalyst in the manufacture of H<sub>2</sub>SO<sub>4</sub> is an example of:  
 a) heterogeneous catalyst b) autocatalysis  
 c) homogenous catalysis d) induced catalysis
80. When KBr is treated with conc. H<sub>2</sub>SO<sub>4</sub> reddish brown gas is evolved. The gas is:  
 a) Br<sub>2</sub> b) Br<sub>2</sub> + HBr c) NO<sub>2</sub> d) H<sub>2</sub>O<sub>2</sub>
81. Low volatile nature of H<sub>2</sub>SO<sub>4</sub> is due to:  
 a) Hydrogen bonding b) Vander Waal's forces  
 c) Strong bonds d) None of these
82. When H<sub>2</sub>S is passed through nitric acid solution, product formed is:  
 a) Milk of sulphur b) Colloidal sulphur  
 c) γ-sulphur d) β-sulphur
83. Gas that cannot be collected over water is:  
 a) N<sub>2</sub> b) O<sub>2</sub> c) SO<sub>2</sub> d) PH<sub>3</sub>
84. The lightest gas which is non inflammable is:  
 a) O<sub>2</sub> b) N<sub>2</sub> c) H<sub>2</sub> d) He
85. Cl<sub>2</sub> gas is evolved as by product in the manufacture of all the following elements except:  
 a) Mg b) Na c) Al d) K
86. The inert gases can be isolated and separated by:  
 a) Electrolysis of their compounds  
 b) Fractional distillation of liquid air  
 c) Adsorption and desorption on charcoal  
 d) both (b) and (c)
87. Which of the following Xenon fluoride is not formed?  
 a) XeF<sub>2</sub> b) XeF<sub>4</sub> c) XeF<sub>6</sub> d) XeF<sub>8</sub>
88. Which of the following statements concerning Noble gases is incorrect?  
 a) They are used to provide inert atmosphere in many chemical reactions  
 b) They are sparingly soluble in water  
 c) They form diatomic molecule  
 d) Some of them are used for advertising
89. Nuclear fusion produces:  
 a) Argon b) Deuterium c) Krypton d) Helium
90. Clathrates are the compounds obtained from noble gases and:  
 a) Water b) Quinol  
 c) Liquid ammonia d) both (a) and (b)
91. Noble gases are absorbed by:  
 a) Anhydrous calcium b) Ferric hydroxide  
 c) conc. H<sub>2</sub>SO<sub>4</sub> d) Activated coconut charcoal