

Answer all the questions ( 25 X 1 = 25)

Reference electrode and working electrode used in the estimation of Fe(II) ions by potentiometry are \_\_\_\_\_.\*

1 point

- ☐ Glass electrode and Platinum electrode
- ☐ Platinum electrode and Standard Calomel Electrode
- ☐ Standard Calomel Electrode and Glass electrode
- ☒ Standard Calomel Electrode and Platinum electrode

Viscosity is due to \_\_\_\_\_.\*

1 point

- ☒ Resistance to fluid motion
- ☐ Roughness of the surface
- ☐ The pressure difference between the two fluids
- ☐ Potential energy stored in fluid

In Mohr's method the solution needs to be near neutral, because \*

1 point

- ☐ Silver precipitates at low pH
- ☒ Chromate forms  $\text{H}_2\text{CrO}_4$  at low pH, which delays the formation of the precipitate.
- ☐ Silver chloride forms at high pH,
- ☐ Potassium chromate dissolves at high pH.

The pH of a liquid solution is a measure of \_\_\_\_\_. \*

1 point

- ☒ Hydrogen ion activity
- ☐ Dissolved salt content
- ☐ Hydroxyl ion molarity
- ☐ Electrical conductivity

The electrolyte solution within the glass electrode (reference) of the pH meter is \_\_\_\_\_. \*

1 point

- ☐ Dilute NaCl
- ☐ Dilute HCl
- ☐ Concentrated HCl
- ☒ Saturated KCl



What is the working principle of conductometry? \*

1 point

- ☐ Measurements of pH
- ☐ Measurement of emf.
- ☐ Measurement of potential.
- ☒ Measurement of conductivity of solution.

When sodium hydroxide is added to HCl, the  $H^+$  ions are replaced by \_\_\_\_\_.\*

1 point

- ☒ Slow moving  $Na^+$  ions
- ☐ Slow moving  $OH^-$  ions
- ☐ Fast moving  $OH^-$  ions
- ☐ Fast moving  $Na^+$  ions

When a strong base is added to a strong acid after the neutralization point \*

1 point

- ☐ Conductance remains constant
- ☐ Conductance decreases
- ☐ Conductance decreases initially and then increases gradually
- ☒ Conductance increases



Temporary hardness of water is caused due to the presence of \_\_\_\_\_ 1 point  
dissolved solids \*

- ☐ Calcium bicarbonates only
- ☐ Magnesium bicarbonates only
- ☐ Sulphates and Chlorides of Calcium or Magnesium
- ☒ Calcium hydrogen carbonates and Magnesium hydrogen carbonates

Conductivity of a solution is directly proportional to \* 1 point

- ☐ Current density
- ☐ Volume of the solution
- ☒ Number of ions
- ☐ Dilution

Estimation of Fe(II) ions by potentiometry is \_\_\_\_\_ titration. \* 1 point

- ☐ Complexometric
- ☐ Acid-base
- ☐ Precipitation
- ☒ Redox



Hardness of water is usually expressed in terms of \_\_\_\_\_ equivalent amount of hardness. \*

- ☐  $K_2CO_3$
- ☒  $CaCO_3$
- ☐  $MgCO_3$
- ☐  $Na_2CO_3$

Which type of reaction occurs in the following reaction  $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$ ? \*

- ☐ placement reaction
- ☒ Double displacement reaction
- ☐ Single replacement
- ☐ Decomposition

A plot of  $\eta_{sp} / C$  (reduced viscosity) vs  $C$  is a \_\_\_\_\_ for dilute polymer solutions \*

- ☐ "V" shape curve
- ☐ "S" shape curve
- ☒ Straight line
- ☐ Triangle



If the ion size decreases in solutions then \*

1 point

- ☐ Does not affect the conductance
- ☒ Conductance increases
- ☐ Conductance decreases
- ☐ First decreases and then increases

The equivalent weight of Sodium Carbonate  $[\text{Na}_2\text{CO}_3]$  is \*

1 point

- ☐ 40
- ☐ 55.85
- ☒ 53
- ☐ 63

Phenolphthalein color in basic medium is \*

1 point

- ☐ Orange
- ☐ Steel Blue
- ☐ Yellow
- ☒ Pink

Estimation of chloride reaction is a \_\_\_\_\_. \*

1 point

- ☐ Catalytic reaction
- ☐ Equilibrium reaction
- ☐ Redox reaction
- ☒ Precipitation reaction



Indicator used for the estimation of hardness in EDTA method is

1 point

\_\_\_\_\_.\*

- ☒ Eriochrome Black – T
- ☐ Phenolphthalein
- ☐ Potassium dichromate
- ☐ Methyl orange

A buffer solution comprises of \_\_\_\_\_.\*

1 point

- ☐ a weak acid in solution
- ☐ a weak base in solution
- ☒ a weak acid and its conjugate base in solution
- ☐ a strong acid in solution

In the Estimation of Fe(II) ions by potentiometry,  $K_2Cr_2O_7$  acts as \_\_\_\_\_.\*

1 point

- ☐ Reducing agent
- ☐ Catalyst
- ☒ Oxidizing agent
- ☐ Indicator



Volume of different concentrations (0.1, 0.2, 0.3 , 0.4 and 0.5 %) of polymer solution used for each viscosity measurement are \_\_\_\_\_.\*

1 point

- ☐ varies with respect to polymer used
- ☒ remains fixed
- ☐ varies with respect to the size of the Ostwald viscometer
- ☐ varies with respect to concentration

The unit of Conductance is \_\_\_\_\_.\*

1 point

- ☐ Ampere
- ☐ Volts
- ☒ Mho
- ☐ Ohm

Which one of the following is NOT a unit for hardness? \*

1 point

- ☐ Degree French
- ☐ Degree clarke
- ☒ Degree centigrade
- ☐ Parts per million





When a mixture of sodium carbonate and sodium hydroxide solution is titrated against HCl solution, the Phenolphthalein end point correspond to

1 point

\*

- ☐ Neutralization of hydroxyl ions and carbonate ions
- ☐ Neutralization of hydroxyl ions only
- ☐ Neutralization of carbonate ions only
- ☒ Neutralization of hydroxyl ions and half of carbonate ions

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