

sheets

Practical physical and inorganic chemistry

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Cairo university
Faculty of science
Chemistry Department

Practical chemistry
First semester
First Year students

Name:

Code number

1- State briefly the properties of a good solvent which may be used for crystallization

a-

b-

c-

d-

2-Define mixed melting point and show how can you use it roughly to differentiate between two organic materials

3-Organic solvent (hexane) was used for the separation of three components A, B & C on a chromatographic paper, R_f values were calculated respectively as 0.3, 0.4 & 0.5. Which component is the most polar one and which one is the most non polar.

4-why we must keep the filter paper warm during the filtration step when we are making crystallization.

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Answer the following questions :

1- Carry out the following mathematical operations and give each result with the correct number of significant figures

a- $1.05 \times 10^{-3} - 0.135 =$

b- $21 - 13.5 =$

c- $12.11 + 18.0 + 1.0113 =$

2- Give the number of significant figures in each of

a- 0.0025

b- 0.0105

c- 0.050080

d- 3.050×10^{-3}

3- On the Celsius scale the 0°C corresponds to 32°F on the Fahrenheit scale. The 100°C to 212°F , if the temperature is 98.6°F , what will it be on the Celsius and Kelvin scales??

4- Give the number of protons and neutrons in each of the following :



protons

neutrons

5- A silicon chip used in an integrated circuit of a micro computer has a mass of 2.68 mg. how many silicon atoms are present in this chip? (Si = 28.086 g/mol)

6- 150 mg of Na_2CO_3 is dissolved in water to give 1.0 L of solution. what is the concentration of Na^+ in parts per million? (1.0 ppm = 1 mg/ml)

7- That is molarity and mole fraction of a 1.0 molal solution of acetone (CH_3COCH_3) in ethanol ($\text{C}_2\text{H}_5\text{OH}$). Density of acetone is 0.788 g/cm^3 and ethanol is 0.789 g/cm^3 . Assume the volume of acetone and ethanol add.

8- The dimerization of butadiene was studied at 500 °C :



the following were obtained:

Time's	195	604	1246	2180	6210
C_4H_6 mol / L	1.6	1.5	1.3	1.1	0.88

Determine the order of the rate and determine the rate constant

9- The reaction : $\text{I}^-(\text{aq}) + \text{CCl}_4(\text{aq}) = \text{ICl}_2^-(\text{aq}) + \text{Cl}^-(\text{aq})$

Proceed as



What is the rate law of the reaction