Part II: Chromatography and Herbal Medicine .....(85 marks)

1- Regarding to sephadex LH20 All are true except;

a- More dense and separate compound of low molecular weight

b- More lipophilic and can separate non polar compounds

c- Adsorption forces play a greater role

d- It can separate water soluble compounds

e- Is prepared from Sephadex G-25 by isopropylation of the OH. groups

2- All Sugars can be separated by

a- Ion exchange chromatography after the formation of borate complex

b- Gas chromatography after silylation

c- Gel filtration d- HPLC using any type of detectors

e- Both (a) and (b)

3- Regarding to high solute diffusivity in carrier gas

a- Gives broad peak b-Is increased by increasing temperature

c- Is decreased by using more viscous mobile phase

d- Is increased by using He e- All of the above

4- The ability of a solute molecules to penetrate the gel matrix depends on

a- Arrangement of atoms in space b- Molecular weight

c- The presence of aromatic or heterocyclic compounds

d- Whether branched or straight-chained e- Both (c) and (d)

5- For separation of glycerol from KCl we use

a- Amphoteric resin and glycerol is eluted first

b- Cationic resin K^+ form and KCl is eluted later

c- Donnan equilibrium and KCl is eluted first

d- Both (a) and (c) e- All of the above

6- Regarding to multifunction strong cationic resins all are true except;

a- Can be prepared by Polycondensation of phenol with formaldehyde with the introduction of sulfonic acid group

b- Is unstable c- Not affected by the change of the pH

d- Copolymerization of methyl acrylic acid with vinyl pyridine

e- Is considered as high capacity resin

7- Regarding to electron capture detectors all of the following are true except

a- Nickel is present as a source of highly energetic electrons

b- Nickel is present to collect the emitted electrons from β rays

c- Decrease in signal rather than increase is measured

d- Is sensitive to halogenated compounds e- Is highly sensitive

8- When we use gradient elution in HPLC we should use degasser with

a- Any type of detectors

b- Refractive index detector only

c- TCD

d- Any type of detector except TCD

e- None of the above

9- Regarding to the partition coefficient in GC. all of the following are true except

a- Is changed when we use high solute concentration

b- Is changed with increasing the rate of diffusion

c- It 's change lead to broadening and asymmetry of beak

d- Is increased by increasing the temperature of the column

e- Both (b) and (d)

10 - Regarding to Gelay columns

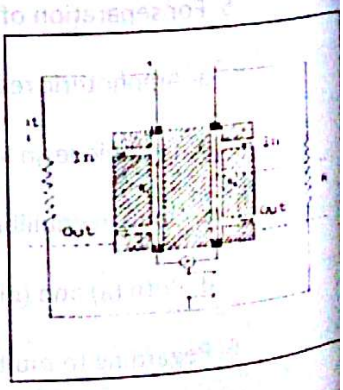
a- Should be open columns.

b- It is used for partition and adsorption chromatography

c- It is used for partition chromatography only

d-The liquid stationary phase is supported by inert support

e- Both (a) and (c)



11- Regarding to this picture all are true except;

a- Must be highly insulated

b- We can use flow programming

c- The heat transfer depend on the rat of motion of the carrier gas

d- The current needed for balancing the bridge is proportion to the sample conc.

e- We use high continuous current for quantitative work.

12- Factors that affect peak shape all are true except;

a- Mass transfer at interface which considered as major transport

b- Rate of diffusion which is radial and axial transport of the solute

c- Increase the plate number of column gives broad beak

d- Increase the thickness of the liquid film gives low Rt

e- Increase the conc. Of the solute cause change in distribution coefficient

13- In separation of mixture composed of glucosamine, glucose and tetramethyl glucose we use

a- Cationic then anionic borate resins column

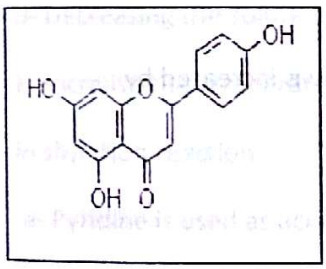
b- Anionic, cationic then anionic borate resins column

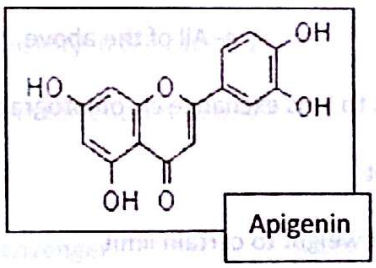
c- Anionic then cationic column

d-Cationic then anionic column

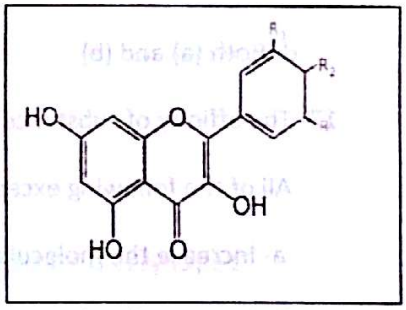
e- None of the above

14- A mixture of apigenin, luteolin and flavone are isolated by





Apigenin



a- Anionic exchange resin and flavone is eluted first

b- Anionic exchange resin and luteolin is eluted later

c- Reversed phase HPLC and luteolin is eluted first

d- Both (a) and (c)

e- All of the above

15- Aldehydes and ketones may be separated by

a- Anion exchange resin after derivatization

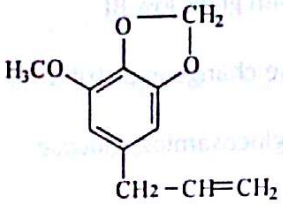
b- Cation exchange resin after bisulfite complexes formation

c- Anion exchange resin after boric acid complex formation

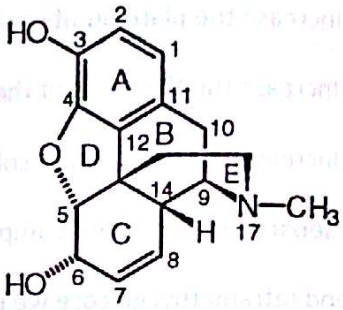
d- None of the above e- Both (a) and (b)

16- This mixture is separated by

Eugenol



Myristicin



Morphine

a- Anionic resin and myristicin is eluted first

b- Anionic resin and morphine is eluted later

c- Cationic resin and morphine is eluted later

d- Both (a) and (b) e- All of the above

17- The affinity of substances to ions exchange chromatography is increased by

All of the following except

a- Increase the molecular weight to certain limit

b- Increase the charge size which suppress the concentration effect

c- Increase the adsorptivity of the compound

d- The presence of aromatic rings in the compounds

e- Increasing the valence

18- In reversed phase partition HPLC

a- The glass beads are coated with polyamide as a support

b- The glass beads are coated with ionic supports

c- Organic non polar solvent is used as mobile phase

d- The polar compounds are eluted later e- Both (a) and (c)

19 - In weak anionic exchanger we use

a- Weakly basic amine polymers at pH (7-14)

b- Quaternary ammonium resins at pH (1-7)

c- Chloromethylated polystyrene treated with tertiary amine

d- Chloromethylated polystyrene treated with 1ry amine

e- Both (a) and (d)

20- To concentrate 20 ml of 10% protein to 20% solution by addition of

a- 5 gm. Sephadex LH20
b- b- 4gm.of sephadex G25
c- 2gm. G50

d- All of the above

e- Both (b) and (c)

21- The performance of the column in gas chromatography is increased by all of the following except

a- Decrease the particles size not less than 50 um

b- The support materials not more than 20%

c- Decreasing the internal diameter of the column

d- Decreasing the solute diffusivity in the carrier gas

e- Increase the temperature in the packed columns

22- In silylation reaction

a- Pyridine is used as acid scavenger b-The reaction is very raped

c- Pyridine increases the stability of silylating agents

d- Both (a) and (c) e- All of the above

23- The detector which allow continuous scanning of the absorbance spectrum of chromatographic eluent is called

a- photodiode array b- Fluorimetric detector c- UV. Detector

d- Infrared detector e- Refractive index detector

24- Introduction of CF3 group to the compound cause

a- Increase the thermal stability of the compounds

b- Improve the separation and reduce tailing

c- Increase the detector response especially ECD.

d- Increase the detector response especially FID.

e- All of the above

25- Regarding to thermoionic alkali bead detectors all are true except;

a- Is affected by flame temperature b- Is affected by Alkali ions concentration

c- Is affected by the type of carrier gas

d- Is used to detect nitrogen and phosphorous pesticide

e- Rubidium chloride is used to detect nitrogenous compounds

26- Regarding to the carrier gas in GC.

a- its flow rate affect both column performance and Rt values

b- Decrease the diffusion coefficient of the gas gives high performance

c- The presence of water in the carrier gas gives broad peak

d-All of the above e- All of the above except (b)

27- Regarding to Sephadex

a- Composed of β 1-6 poly glucose

b- Is prepared by Condensation of dextran and glycerol with epichlorohydrin

c- Stable in strong acidic solution

d- Sterilized in alkaline solution at 120°C without hydrolysis e- Both (a) and (d)

28- Regarding to void volume all of the following are true except

a- It is determined by Dextran blue 2000

b- Equal to Vt – (Vi + Vg) c- Equal to Wg x Wr

d- Contain the largest molecular weight compounds

e- It is the volume of the liquid between the beads

29- In gel filtration the distribution coefficient Kd is equal to

a- Zero with largest molecules b- one with aromatic large molecules

c- More than one with smallest aromatic molecules

d- One with aromatic smallest molecules e- Both (a) and (c)

30- The buffer is important in chromatographic separation because

a- It promote the stability of compounds in gel filtration

b- It increases the difference in charge size in ion exchange chromatograph.

c- It increases the volatility of compounds in GC.

d- Both (a) and (b) e- All of the above

31- Regarding to strong anionic resins

a- Is prepared from chloromethylated polystyrene treated with tertiaramine

b- Poly condensation of phenol with formaldehyde

c- Polymerization of styrene with introduction of sulfonic acid group

d- Copolymerization of methyl acrylic acid with vinyl pyridine

e- Is prepared from chloromethylated polystyrene treated with 2ry amine

32- Mixture of 30% $AlCl_3$, 30%NaCl and 40%$CaCl_2$is separated by

a- Cations exchange resin and NaCl is eluted first

b- Cations exchange resin and $CaCl_2$ is eluted later

c- Cations exchange resin and $AlCl_3$ is eluted later

d- Both (a) and (b)

e- Both (a) and (c)

33- Neutralization of alkaline solution can be carried out by the use of

a- Na^+ form cationic resin

b- H^+ form cationic resin

c- Cl^- form resin

d- OH^- form anionic resin

e- Both (b) and (c)

HERBAL MEDICINE:

34- All of the following are true for herbal medicines except:

a- High level of safety.

b- Increase patient compliance

c- Used in case of chronic fatigue syndrome

d- Not potent

e- Both a and c