

Q1) Fig. to the right is a phase diagram of Silica - Forsterite.

Liquid A cools under equilibrium conditions.

And answer the following:-

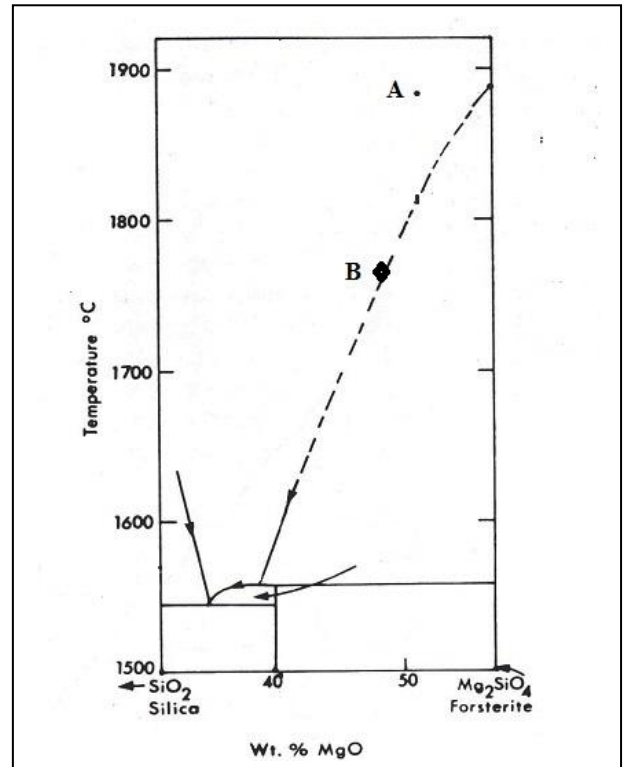
1-Complete Fig.

2-The name of the first crystal?

3-Calculate the percentage of crystal and liquid at B.

4-When and why does the mineral crystalline react with the melt?

5-At the eutectic point what will crystallize? Do you think that the melt reaches this point under non-equilibrium conditions?



6-When do the forsterite and silica crystalline together and why?

7- What do we call this system? Why?

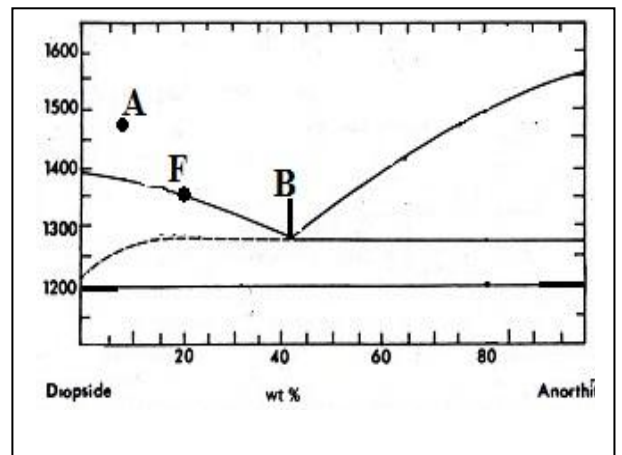
Q2)- Fig. to the right is a phase diagram of Anorthite – Diopside. Liquid A cools under equilibrium (Lab) Conditions. Answer the following

1- Complete Fig.

2- The first mineral crystallized

3- Percentage of crystal and liquid at F

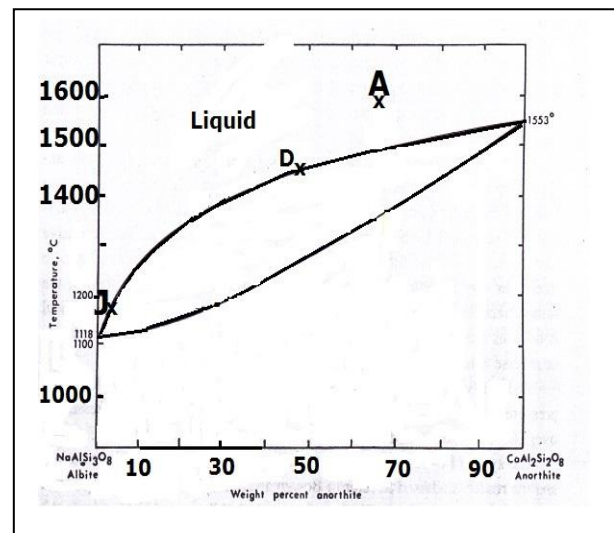
4- The temperature and the composition of eutectic point



5- Name the minerals that formed when liquid B start crystallization

6- The name of this system

**Q3)** The Fig. to the right is a phase diagram Of Anorthite – Albite. Liquid A cools under equilibrium (Lab) and non equilibrium (natural) Conditions. Answer the following (10 marks)



- 1- The composition of first crystal
- 2- Percentage of crystal and liquid at D
- 3- The composition of last solid at equilibrium condition (Lab)
- 4- Why the liquid reach the point J
- 5- The composition of last solid at non-equilibrium condition (Natural)

**Q4)** Answer the following: -

- 1- Draw a sketch of atypical Ophiolite
- 2- Draw a sketch for the Silica system
- 3- List the origin of Alpine Ophiolite
- 4- Dentex,1969 classified alpine peridotite
- 5- The physical evidence
- 6- List the layers of oceanic crust at the oceanic basin

**Q5)** Give reasons for the following (

- 1- Occurrence of the low-velocity zone within the upper mantle
- 2- Upper crust composed of granodiorite
- 3- Pyrolite is not a rock
- 4- The lower crust is not composed of basic rocks.
- 5- Eclogite occurs within the upper mantle
- 6- Spinel lherzolite occurs with alkali basalt

**Q6)** Complete the following Sentences:-

- 1- The lower crust have basic composition not basic rock **because of**-----
- 2- Low velocity zone occurs at depth 70-150 Km . within mantle because ---
- 3- Alpine peridotite is-----
- 4- Dentex,1969 classified alpine peridotite **to**-----
- 5- Ringwood (1975) gave two possibilities for the formation of eclogite -----
- 6- Silica have four polymorphism depend on temperature, which are-----
- 7- Fosterite and silica crystalline together when-----
- 8- Nepheline- silica is binary system with -----
- 9- Coleman, 1971:- assume that the origin of Alpine peridotite **is**-----
- 10- Many petrologists criticized this composition of pyrolite because of -----
- 11- The Ringwood (1975) gave two possibilities for the formation of eclogite in upper mantle, which are-----
- 12- Many petrologists criticized the composition of pyrolite because-----

- 13- Forsterite- Silica system, Olivine and quartz presence when-----in ---  
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- 14- Magmatic differentiation is -----
- 15- Pressing crystallization happen as results of -----
- 16- Hybridization is-----
- 17- Syn COLG characterized by-----
- 18- Reasons for the generation of granitic melt are-----
- 19- Volcanic rocks formed above supra Benioff zone Series characterized by potassium variation, These rocks are-----
- 20- Continental VAG is located within ----- and its composition is ---  
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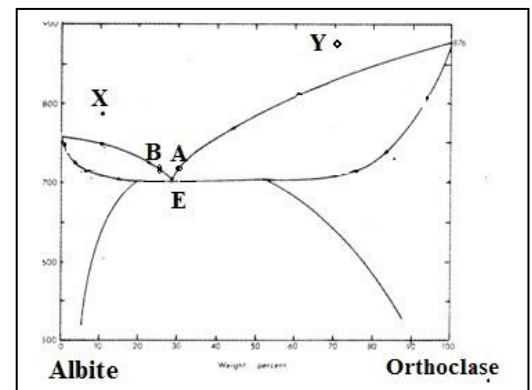
**Q7) Answer the following :-**

A- Draw a sketch for typical Ophiolite

B- Draw a sketch of binary system with intermediate component that melted incongruently

**Q8)** The Fig. to the right is a phase diagram of Albite – Orthoclase under 5 Kbar. Liquid X and Y cools under equilibrium Conditions. Answer the following **(15 marks)**

- 1- Complete the Fig.
- 2- The composition of first crystal crystalline from Liquid X an Y
- 3- The composition of first crystal crystalline at point A an B
- 4- What happen at E point
- 5- Name of the textures formed at B and E



**Q9) Answer the following:-**

A- Define Ophiolite? Draw a sketch for typical ophiolite

B- Define magmatic differentiation and list its processes

C- Why Eclogite formed at upper mantle?

D- Discuss the origin of Alpine peridotite

E- Discuss the types of volcanic rocks formed at above Benioff Seismic Zone

**Q10)** list the general feathens of NEPHELINE-KALSILITE-SILICA System ?

