Salahaddin University
College of Science
Department of Geology

Mineralogy
First year
Time: 1.5 hour

Final Examination- Set 1

Q1: Define the following terms: ***(12 marks)***

Bauxite- Zeolite group- Isomorphous minerals- Ionic bond

Q2: Complete the following sentences with a proper words or statements.

(36 marks)

a) The minerals are named on the basis of: 1 …….. 2 ……..…….. 3 …….

b) A mineral example for ionic bond is .....…; covalent bond is ……..; metallic bond is ……

c) Inosilicates are divided to three groups: 1…….. 2…… 3.……

d) The pyroxene and amphibole groups are differ in 1 ……. 2 …… 3 ……..

e) The three polymorphous minerals of Al_2SiO_5 are: 1 …….. 2 ……. ……. 3 ……

f) Sphalerite is crystallized in …….system, graphite in ……. system and aragonite in ……. system.

g) Give an example for oxides: 1. A_2X type……... 2. AX type …….. 3. AX_2 type ……

h) Sulphides are divided to many types according to the …….. ratio.

i) Copper is most commonly associated with …….. rocks and graphite is common in ……. rocks.

Q3: The following sentences are either true or false. Mark (✓) in front of the right and (X) in front of the false, and correct the false. ***(27 marks)***

a) Most minerals have two or more bond types coexisting together.

b) Feldspathoid group is anhydrous framework silicates, and its composition reflects formation from high silica.

c) Zeolite group is hydrous framework aluminosilicate of hard and high density.

d) Most of sulphide minerals are of hydrothermal origin.

e) The name electrum is applied to natural gold with 20% or more of iron.

f) The structure of kaolinite is formed from one tetrahedra and two octahedra.

g) 5-membered ring and rings with more than 6-tetrahedra are unknown.

h) The pyroxene group being single chain structure and amphibole group double chain structure.

i) Bridging oxygen is that linked the SO_4 group with cations in sulphate class.

Q4: Give the reason for the following: ***(16 marks)***

a) Forsterite and olivine are incompatible with free silica.

b) Zircon is radioactive mineral.

c) Perfect and easy cleavage of graphite mineral.

d) The gibbsite structure is referred as dioctahedral.

Q5: Draw the structure for the following: ***(9 marks)***

a) Face centered cubic lattice.

b) Inosilicates (single chain only).

Good Luck

Prof. Dr. Faraj H. Tobia

Salahaddin University
College of Science
Department of Geology

Mineralogy
First year
Time: 1.5 hour

Final Examination- Set 1

Q1: Define the following terms: ***(12 marks)***

Isotope- Pseudomorphism- Luster- metallic bond

Q2: Complete the following sentences with a proper words or statements. ***(36 marks)***

a) The three polymorphous minerals of TiO_2 are: 1…….
2…….. 3…….

b) Minerals with covalent bonds are characterized by: 1 ……..……..
2 …… 3 ……

c) Solid solution is controlled by: 1 ……..…….. 2 …….……

d) Give a mineral example for: 1. nesosilicate ……..…; 2. cyclosilicates …….. ; 3. tectosilicate ……

e) Nesosilicate subclass is characterized by: 1 …… ……. 2)….……
…….. 3 ……..

f) Give an example for sulphides: 1. A_2X type……... 2. AX type ……..
3. AX_2 type …….

g) Sphalerite is crystallized in …….system, graphite in ……. system.

h) The minerals of oxide class are characterized by: 1…….
2……. 3……..

i) The general formula of single chain inosilicates is ……..... and of tectosilicate is …….

Q3: The following sentences are either true or false. Mark (/) in front of the right and (X) in front of the false, and correct the false. ***(36 marks)***

a) The hardness of the mineral is related to the attraction force between atoms.

b) Feldspathoid group is anhydrous framework silicates, and its composition reflects formation from high silica.

c) Sulphides predominantly of glassy luster and with a general formula A_mX_p.

d) Most of sulphide minerals are of hydrothermal origin.

e) The structure of diamond is of very strong tetrahedral bonding of one carbon to 4 neighbors.

f) The structure of talc is formed from one tetrahedra and two octahedra.

g) The luster is largely dependent on the color of the mineral.

h) The pyroxene group being single chain structure and amphibole group double chain structure.

i) Hydroxides are very common minerals, which produced by weathering and hydration of other minerals.

Q4: Give the reason for the following: ***(16 marks)***

a) Zircon appears as a detrital mineral in river and beach sand.

b) Absence of anorthite-rich plagioclase in moderate temperature and high pressure.

c) The tectosilicates have low density.

d) The brucite structure is referred as trioctahedral.

Q5: Draw the structure for the following: ***(9 marks)***

a) Body centered cubic lattice.

b) Cyclosilicates (4-membered only).

Good Luck

Prof. Dr. Faraj H. Tobia

Salahaddin University
College of Science
Department of Geology

Mineralogy
First Year
Time: 1.5 hour

Final Examination- Set 2

Q1: Define the following terms: ***(12 mark)***

a) Limonite **b)** Electrum **c)** Zeolite group **d)** Isomorphous minerals.

Q2: Give the reason for these following: ***(16 mark)***

a) Zircon is radioactive mineral.

b) Gibbsite and brucite have relatively low hardness.

c) Olivine and quartz cannot crystallize together in a rock.

d) The good electrical and thermal conductivity in minerals that have metallic bonds.

Q3: The following sentences are either true or false. Mark (/) in front of the right and (x) in front of the false, and correct the false. ***(27 mark)***

a) Sulphides predominantly of nonmetallic luster and with a general formula A_mX_p.

b) The sorosilicate subclass has a formula $(Si_2O_7)^{-6}$ and the most common minerals are: epidote group.

c) The form and the cleavage are the important distinguishing features between pyroxene and amphibole.

d) In general, the increasing the complexity of silicate structure is followed by increasing the density and packing of ions.

e) Feldspathoid group is anhydrous framework silicates, and its composition reflects formation from high silica.

f) Most of sulphide minerals are of hydrothermal origin.

g) The structure of kaolinite is formed from one tetrahedra and two octahedra.

h) 5-membered ring and rings with more than 6-tetrahedra in cyclosilicates are unknown.

i) Bridging oxygen is that linked the SO_4 group with cations in sulphate class.

Q4: Complete the following sentences with a proper words or statements.

(36 mark)

a) Most common minerals of cyclosilicates are: 1……..

2…… 3……..

b) The pyroxenoid minerals are differ from pyroxenes in……..…and

……...……

c) All the minerals in tectosilicates are aluminum silicates of Na^+, K^+, Ca^{2+}, and Ba^{2+}except the minerals of…….group.

d) The classification of mineral species is according to the ……..

e) A mineral example for ionic bond is .....…; covalent bond is ……..

metallic bond is ……

f) Inosilicates are divided to three groups: 1…….. 2.…… 3.……

g) The types of non-metallic luster are: 1…… 2……
3……

h) Sphalerite is crystallized in …….system, graphite in ……. system and aragonite in ……. system.

i) Give an example for oxides: 1. A_2X type…..... 2. AX type ……..

3. AX_2 type …….

j) Sulphides are divided to many types according to the …….. ratio.

k) The ratio of Si:O in the tetrahedral sheets of tectosilicate is …….....

Q5: Draw the structure for the following: ***(9 marks)***

a) Body centered cubic lattice.

b) Cyclosilicates (3-membered only).

GOOD LUCK

Prof. Dr. Faraj H. Tobia

Salahaddin University
College of Science
Department of Geology

Mineralogy
First Year
Time: 1.5 hour

Final Examination- Set 2

Q1: Define the following terms: ***(12 mark)***

a) Bauxite **b)** Streak **c)** Polymorphous minerals **d)** Amorphous materials.

Q2: Give the reason for these following: ***(16 mark)***

a) The structure of brucite sometimes referred to as trioctahedral.

b) Nesosilicates generally characterized by equidimensional nature of their crystal.

c) Zircon appears as a detrital mineral in river and beach sands.

d) The tectosilicates have low density.

Q3: The following sentences are either true or false. Mark (/), in front of the right and (x) in front of the false and correct the false. ***(27 mark)***

a) The name electrum is applied to natural gold with 20% or more of iron.

b) Graphite is of common occurrence in sedimentary rocks.

c) The nesosilicate subclass are those silicates with isolated $(SiO_4)^{-4}$ group in the structure.

d) The structure of kaolinite is formed from one tetrahedra and one octahedra.

e) The luster is largely dependent on the color of the mineral.

f) Under the moderate temperature and high pressure of low and medium grade metamorphism the epidote group minerals are more stable than anorthite.

g) Sulphur is most commonly found in igneous rocks associated with gypsum and limestone.

h) Feldspathoid minerals have tectonic and economic importance.

i) Hydroxides are very common minerals, which produced by weathering and hydration of other minerals.

Q4: Complete the following sentences with a proper words or statements:

(36 mark)

a) TiO_2 occurs in three polymorphous forms: 1).....2).....3).....

b) The native element class is divided in to two subclasses: 1).....

2.....

c) The silicates are subdivided into six subclasses, according to ……...

d) The color of minerals depends on: 1)……. 2)……....

e) Leucite = ……..- silica (SiO_2).

f) The Si:O ratio in the phyllosilicates is …….. and in sorosilicate is……

g) The oxides class of minerals are characterized by: 1…… 2……

3…….. 4……

h) The pyroxene and amphibole groups are differ in 1 …….

2 …… 3 ……..

i) The chemical composition of hematite is ……. and for gypsum is ……..… and for zircon is ……

j) The crystal system of the graphite is …… and for opal is ..…… and for diamond is ……..

Q5: Draw the structure for the following: ***(9 marks)***

a) Face centered cubic lattice.

b) Inosilicates (single chain only).

GOOD LUCK

Prof. Dr. Faraj H. Tobia

Salahaddin University
College of Science
Department of Geology

Mineralogy
First Year
Time: 2 hours

Final Examination- Set 3

Q1: Define the following statements: (16 marks)

a) Mineraloid **b)** Isomorphous minerals **c)** Zeolite group **d)** Streak.

Q2: Give the reason for the following: (16 marks)

a) Perfect and easy cleavage of graphite mineral.

b) Actually, opal ($SiO_2.nH_2O$) is not regarded as mineral.

c) Low melting point of sulphur.

d) Cleavage planes often show pearly luster.

Q3: Complete the following sentences with a proper words or statements. (36 marks)

a) The most common minerals of phyllosilicates are: 1…….……. 2…… 3…….

b) The sheet structure produces the ……. form and chain structure produces the ……. crystals.

c) The pyroxenoid minerals are differing from pyroxenes in……and…… of the SO_4 tetrahedra.

d) Feldspar group fall into two subgroups:1……. 2…….

e) All the minerals in tectosilicates are aluminum silicates of Na^+, K^+, Ca^{2+}, and Ba^{2+} except the minerals of……. group.

f) The classification of mineral species is according to the …….

g) Minerals with covalent bonds are characterized by: 1. ……. 2. …… 3. ……

h) The different kinds of fractures are: 1…… 2. ……..……3.…….

i) Give a mineral example for: 1. nesosilicate ……..… 2. cyclosilicates ……. 3. tectosilicate ……. 4. phyllosilicate …….

j) The three polymorphous minerals of Al_2SiO_5 are: 1……..... 2. ……..……...…. 3…….

Q4: The following sentences are either true or false. Mark (/), in front of the right and (X) in front of the false, and correct the false. (24 marks)

a) Variation in the Mohs scale is linear when compared with absolute measurements. hardness

b) Bridging oxygen is that linked the CO_3 group with cations in silicate class.

c) In general the increasing the complexity of silicate structure is followed by increasing the density and packing of ions.

d) The pyroxene contains essential $(OH)^-$ group in the structure and the S: O ratio is 4:11.

e) Pyroxenes form at higher temperatures than do amphiboles.

f) Most minerals have two or more bond types coexisting together.

g) Feldspathoid group is anhydrous framework silicates, and its composition reflects formation from low silica.

h) Wollastonite and rhodonite are belonging to pyroxenoid group.

Q5: Draw the structure for the following: (8 marks)

a) Cyclosilicates (3-membered only).

b) Inosilicates (single chain only).

Good Luck

Prof. Dr. Faraj H. Tobia