

COURSE EXAMINATION PAPER OF RESOURCE GEOLOGY

(With answers)

I. TO EXPLANATE THE FOLLOWING TERMS

(Ten terms , 2 marks per term, total 20 marks)

1. **Ore:** the rock material or minerals which are mined for a profit; **Gangue Minerals:** the minerals having no commercial value, they just happen to be mixed up with the ore minerals; **Non-ferrous metal (Base metal):** Copper, lead, Zinc, Nickel, Tungsten, Tin, Molybdenum, Bismuth, Stibium, Mercury **Precious metal:** Gold, Silver, Platinum, Palladium, Osmium, Iridium, Ruthenium, Rhodium; **Sulfophilic elements:** S Se Te As Sb Cu Pb Zn Ag Hg Cd Bi; **Host Rock:** the rock lithology (type) which contains the ore. May or may not comprise ore. **connate water:** Water trapped in sediments at the time they were deposited is known as connate water; **Country Rocks:** the rocks of no commercial value surrounding the host rocks and/or the ore. **Alteration:** Any change in the mineralogical composition of a rock brought about by physical or chemical means, especially by interaction with hot or cold aqueous solutions or gases. **Porphyry copper deposit:** a kind of huge, low-grade hydrothermal deposits which is spatially, temporally and genetically associated with hydrothermal alteration of the host rock intrusions and wallrocks.

II. SELECT THE CORRECT TERMS FROM THE GIVEN ANSWERS

(Ten questions , 3 marks per question, total 30 marks)

1. What is any volume of rock containing an enrichment of one or more minerals called?
☒ A. Mineral deposits; B. Mineral dumps; C. Mineralization; D. Mineral mines
2. Within the 5 ways minerals become concentrated, which of the following occur by weathering processes?
A. Magmatic Mineral Deposits; B. Sedimentary Mineral Deposits;
☒ C. Residual Mineral Deposits; D. Hydrothermal Mineral Deposits; E. Placers
3. Many kinds of mineral deposits occur in groups called _____?
A. magmatic mineral deposits; B. residual mineral deposits; ☒ C. placers;
D. hydrothermal mineral deposits; E. metallogenic provinces;
4. T or F, Many kinds of mineral deposits tend to occur in groups and form metallogenic provinces?
☒ A. True; B. False
5. True or False, The distribution of many kinds of mineral deposits is controlled by plate tectonics.
☒ A. True; B. False
6. What are remains of plants and animals trapped in sediment that may be used for fuel?
A. Gangue; B. Residual Mineral Deposit; C. Mineral Deposit; ☒ D. Fossil Fuel
E. Placer
7. Copper, Gold, lead, galena, sphalerite. What is the geologic concentration process of these raw materials?
A. soil leaching; B. placer sorting; ☒ C. hydrothermal precipitation; D. igneous cooling;
E. evaporation
8. What is an example of a non-metallic resources.
A. Aluminum; ☒ B. Clay; C. Lead; D. Steel;
9. Which of the following is a energy resource that is a non-renewable?

A. Solar energy; B. Wind energy; **C.** Nuclear energy; D. Ocean thermal energy
E. None of the above

10. Which of the following materials is not produced by hydrothermal precipitation?

A. Copper; B. Galena; C. sphalerite; **D.** talc; E. lead

III. BRIEFLY ANSWER FOLLOWING THE QUESTIONS. (3 questions , 10 marks per question, total 30 marks) (answering questions in Chinese is allowed)

1. oncentration processes that lead to the formation of ore deposits are there in our study?

① By selectively removing a large fraction of components from approximately average rocks and thereby concentrating one or more elements in the residuum

② By direct concentrating one or more previously dispersed elements or compound through extracting them from country rocks;

③ Most ore deposits have been formed by processes that have brought together previously dispersed elements or compounds. These processes have almost invariably involved one or more fluid phases and have driven by physical, chemical, and biological mechanisms;

2. What roles did the ore-bearing fluids play in formation of ore deposits?① dissolving and extracting metals from country rocks;

② migrating ore-forming compositions through the wall-rock ;

③ make ore precipitate

3. What are skarn deposit formation conditions?

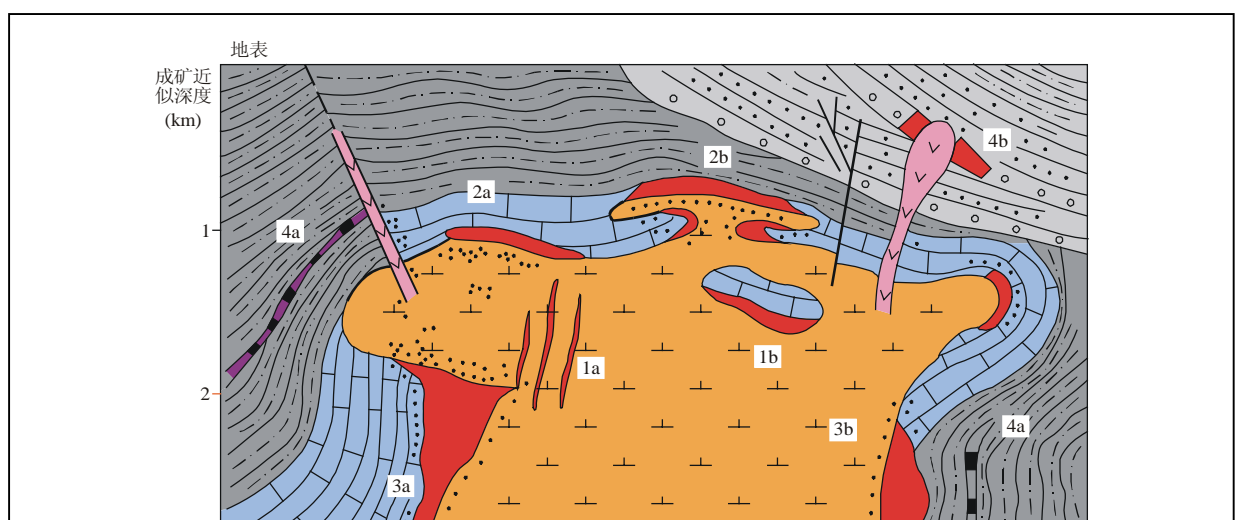
①. Magma significant: The ore-bering fluids from the intrusive bodies are important condition concerning the process of forming skarn deposits.

②. Country rocks: The favorite country rocks mainly are sedimentary carbonates which are of high activity and brittle, easily being broken into the permeable cataclastic rocks.

③. Structural controls on the skarn deposits: Aureole structures; cracks and breccia in the interbedded fractrual zone; Feld structures; Xenolith structures;

IV. EXPLANATION THE MODEL FIGURES WITH GEOLOGICAL CHARATERS OF ORE DEPOSITS (Choicing to answer 2 questions from 3 questions , 10 marks per question, total 20 marks) (answering questions in Chinese is allowed)

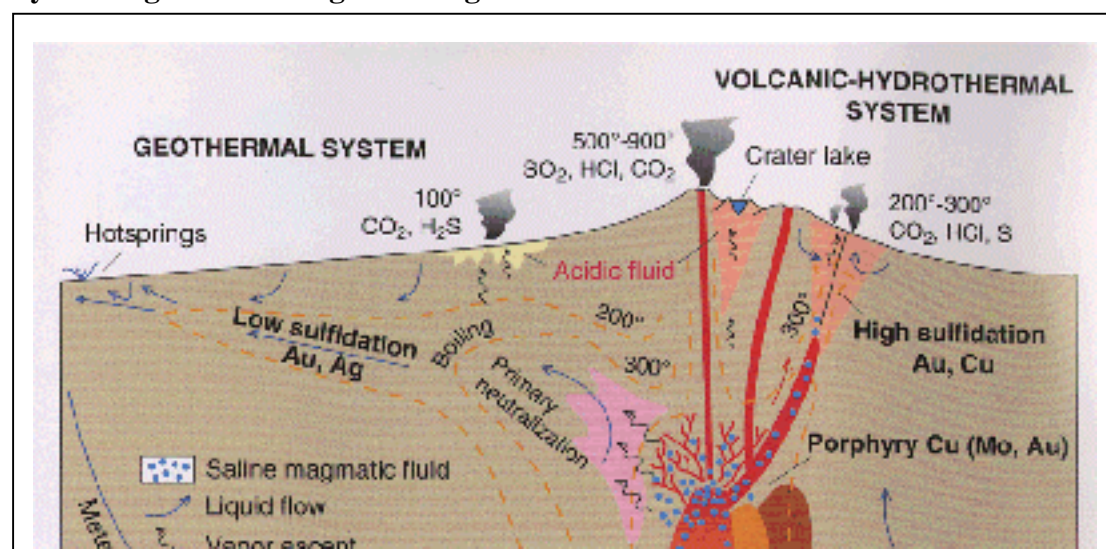
1. To describe the main charaters of the shown ore deposit by unscrambling the following figures.



Referent answer points:

1. ore deposit type;
2. geological conditions controlling on the formation of ore deposit shown in figure;
3. basic geological characters of ore deposit;

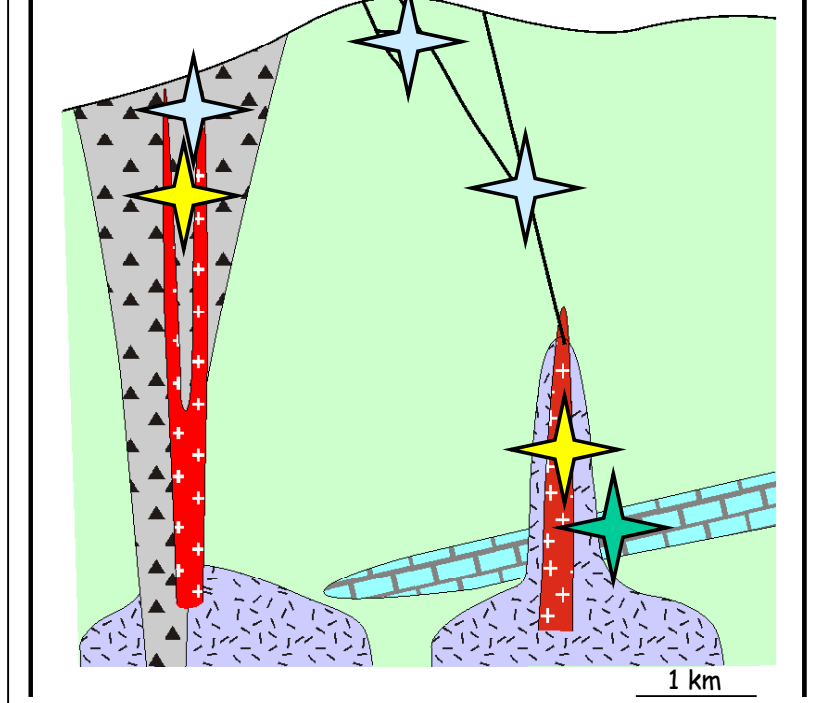
2. Explanation the formation conditions and processes of epithermal ore deposit by reading the following model figure.



Referent Answer:

Low sulfide deposits	high sulfide deposits
Deposit Form Open-space veins dominant, stockwork ore common Disseminated and replacement ore minor ◆ Textures Veins, cavity filling (bands, colloforms, druses), breccias ◆ Ore Minerals Pyrite, electrum, gold, sphalerite, galena (arsenopyrite) ◆ Gangue Quartz, chalcedony, calcite, adularia, illite, carbonates ◆ Metals •Au, Ag, Zn, Pb (Cu, Sb, As	Disseminated ore dominant, replacement ore common Stockwork ore minor, veins commonly subordinate Wallrock replacement, breccias, veins Pyrite, enargite, chalcopyrite, tennantite, covellite, gold, tellurides Quartz, alunite, barite, kaolinite, pyrophyllite Cu, Au, Ag, As (Pb, Hg, Sb, Te, Sn, Mo, Bi)

3. To find the possible types of ore deposits and briefly give their properties from following model figure.



Referent answer points:

- 1. porphyry type of ore deposits and their formation conditions;**
- 2. epithermal ore deposits and their formation conditions;**
- 3. skarn type of ore deposits and their formation conditions**