ES 11 Text Questions

P11 Assigned Sept 13/14

7. Protoplanet Hypothesis: A great cloud of dust and gas 10 Billion km wide rotated slowly through space about 5 BYA. The pull of its own gravity caused it to shrink or collapsed due to a passing star. Most of the material gathered around its center. Shrinking made it rotate faster, and build heat in the center, enough heat to initiate hydrogen fusion which blazed into a newborn sun. Estimated 10% of cloud material formed a great platelike disk surrounding the sun far into space. Friction within the disk caused eddies which shrank into more compact masses called protoplanets. Uncollected material remains as comets, meteoroids and asteroids.

8. a) 3 ways Earth got hotter in its early history: compression , radioactive minerals, and bombardment by meteorites that create heat and friction

b) How oceans formed: The heat melted iron that sank toward the cener of EARth, melting other materials as it went, releasing trapped water and gases. Molten materials separated into layers. Steam escaped condensed into water that slowly accumulated as oceans.

9a) How present atmosphere differ from Earth’s original atmosphere:Today’s atomospher is 78% N, 21% Oxygen. Original atmosphere is assumed to come from volcanoes which is >50% water vapour with large amounts of CO2 and sulfur, very little free oxygen.

b) How Earth’s atmosphere got it’s oxygen: from break up of water moleculesb sunlight in the upper atmosphere. Later plants to grow which created more oxygen via photosynthesis.

10a) diagram of earth:

b) How Earth’s interior got its layered structure: As temperature increased, iron and nickel melted and flowed toward center, melting rocks, forcing lighter materials up to surface, forming crust.

Sept 17/18  Read pages 29-33 of your text and answer Questions #1, 2, 5, 6, 7 on page 33.

1. Matter is anything that has mass and takes up space. Not energy. Particle Model of Matter states that all matter is made up of tiny particles called atoms.
2. An element is a substance that cannot be broken into simpler substances by ordinary chemical means.

An atom is smallest part of an element that has all the properties of that element.

John Dalton was and English chemist who came up with the particle model.

5. Atomic number = number of protons of an atom

Mass number = protons + neutrons of an atom

Sodium contains 11 protons, 11 electrons, 12 neutrons (23-11)

6. An Isotope is an atom of the same element that has same number of protons but different number of neutrons.

b) Carbon-12 has 6p, 6e, 6n. Carbon-13 has 6p, 6e, 7n. Carbon-14 6p, 6e, 8n

7. a) Compound – two or more elements chemically bound together.

b) Molecule – smallest particle of a compound that still retains the properties of the compound.

c) Compound is different from mixture: mixtures will have properties of

 each element within the mixture, can be combined in any proportions, can be easily separated by physical means.

Sept 20/21 HW: Read pages 34-36, Answer # 8, 9, 10, 12,

8. a) 5 factors determining a mineral: naturally occurring Inorganic, solid, ordered pattern structure with definite chemical composition.

b) Minerals: gold, granite, halite, diamond

c) NOT: window glass – man made, pearl- organic, water -not solid, coal – organic

9. a) most common elements on Earth: silicon and oxygen (then aluminum, iron, calcium, sodium, potassium, magnesium)

b) common elements usually occur as compounds, solids,

c) Oxygen and silicon are important elements because they are most abundant, and they chemically combine to form many of the minerals that make up Earth’s crust.

d) Native minerals have only one element – diamond, gold, copper, sulfur,

10. a) An ion is an atom that has gained a charge

b) ions form by either losing or gaining electrons

c) ionic bond is a chemical bond between two or more ions (one negative, one positive. Always between a metal and a non-metal)

12. Two ways minerals can form: cooling magma, evaporation of water from dissolved substances. Also heat, pressure or chemical action of water can also create minerals.

Sept 24/25 HW: Read pages 47-51, Answer #1,2,3,5,6 p 52

1. A) Rock forming minerals are minerals that make up the Earth’s crust. Most are silicates.

Examples of rock forming minerals are: silicates (quartz), carbonates (calcite), feldspar, mica

b) Minerals are usually identified by colour, lustre, crystal shape.

c) mineralology is the study of minerals AND their properties.

1. A) Three reasons why it is difficult to identify minerals by colour alone: Many have similar colours, impurities can change the colour – you see the colour of the impurity not the mineral, some minerals change colour when exposed to air.

b) Lustre is how a mineral reflects light. Different types of lustre: pearly (talc, feldspar), vitreous or glassy (obsidian), greasy (opal), silky, metallic (galena)

c) Crystal shape is not helpful in identifying minerals because often they are too small to see.

1. A)A minerals streak is the colour of its powder and is obtained by scratching it across a ceramic tile. Metallic minerals have dark streak, non-metallic have light/colourless.

b) Cleavage is the tendency to split along flat surfaces. Minerals that can be identified by cleavage: Mica- one direction, felspar – two directions, calcite and galena – three directions.

c) Fracture is the tendency to break along non-cleavage surfaces. Examples: Conchoidal fracture in flint obsidian.

c) hardness is a minerals resistance to being scratched. Determined by what substance it can scratch or what scratches it. Use Moh’s hardness scale

5 Acid Test: a few drops of HCl on the mineral. If it fizzes then it is reactive it acid and most likely has CaCO3 in it.

6. Minerals that can be identified by a) magnetism – magnetite, b) taste- halite c) fluorescence-fluorite, calcite d) phosphorescence – willemite (zinc silicate), e) radioactivity -carnotite and uraninite f) double refraction- calcite

. Page 57 7ad, 8ab, 9ab

7. a) Most abundant group of silicates: Feldspar

D) ferromagnesian silicates are silicates that contain iron and magnesium. Examples: hornblende, pyroxenes, olivine.

8 a) carbonate minerals are different from silicates: No silica tetrahedron, contain one carbon and three oxygen plus a metal ion. Compare and Contrast Calcite and dolamite: Calcite most common, calcium carbonate, colorless or white hardnes 3, three perfect cleavage – identified with acid test. Dolamite is calciummagnesisum carbonate, harder, also cleaves into rhombs, not as reactive to acid

9a) forms of hematitie. All hematite forms have red-brown streal

B) magnetitie and lodestone – Lodestone is a highly magnetic form of magnetite.