

SCIENCE 10 - BIOLOGY REVIEW PACKAGE

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Complete the short answer questions on a separate piece of paper.

- 1) Arrange the following terms in order of complexity, and give an example of each: ecosystem, biosphere, organism, community, population
- 2) (1) (5) (3) (4)

For the pond ecosystem on the left, identify two biotic factors and two abiotic factors.



What is meant by the term dynamic equilibrium?

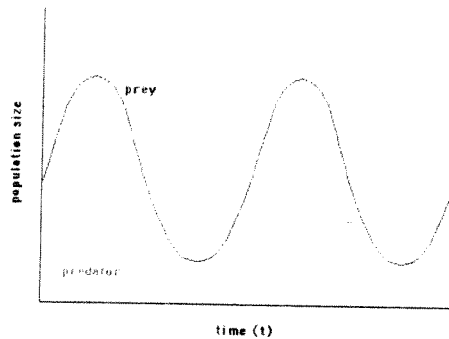
What might be a limiting factor for the pond ecosystem?

PLANT, FISH, INSECTS, BIRDS (3)
 SUN, LIGHT, AIR, WATER
 CONTINUOUS CHANGE, BUT OVERALL SYSTEM REMAINS STABLE!
 WATER, FOOD RESOURCES

3. Draw a simple food chain. Include the following terms in your food chain: producer, autotroph, consumer, heterotroph, herbivore, primary consumer, carnivore, secondary consumer, tertiary consumer, detritivore, decomposer. Give an example of each.

4. What does this graph represent? How might this graph look different if you were using real populations in nature?

Changes in Prey - predator Population Size



p. 28

(Handwritten scribble)

5. Complete the following table:

Type of symbiosis	Definition	Example
Mutualism	BOTH BENEFIT	LICHENS: PHOTOSYNTH. & FUNGUS
Commensalism	ONE BENEFITS, THE OTHER: NO	BARNACLES - CRAB WALKER
Parasitism	HOST HARMED	TAPEWORMS, TICKS, FLEAS

6. Explain the term "trophic level" in your own words. What type of food is eaten by a consumer in the second trophic level? MEAT - CARNIVORE!

7. How might the shape of an energy pyramid differ throughout the year in an area that has a cold winter and a warm winter?

MAY GET TALLER!

8. If there are 25,000kJ of energy in one trophic level, how much energy will be passed on to the next trophic level?

2500 KJ

PRESENT CO-EXISTIONS

9. What is the difference between weather and climate?

LONG TERM PATTERN

10. Explain generally how latitude, elevation, and distance from a body of water can influence climate.

11. Why does Vancouver have four distinct seasons? Why wouldn't a city on the equator have four distinct seasons?

CONTRAST ↑ = COOLING

12. Your textbook describes 8 terrestrial biomes. Which biome corresponds with the following:

- a) highest annual precipitation
- b) lowest annual temperature
- c) fewest number of herbivores
- d) most consistent annual temperature
- e) forest with the shortest growing season

TROP. RAINFOREST
POLAR ICE
- TROP. RAIN.
~~POLAR ICE~~

13. Define the following terms: adaptation, natural selection, mimicry, coevolution, extinction, extirpation, keystone species, and biodiversity

BETW DIFFERENT SPECIES

14. Give an example of interspecific competition and an example of intraspecific competition. How can competition lead to resource partitioning?

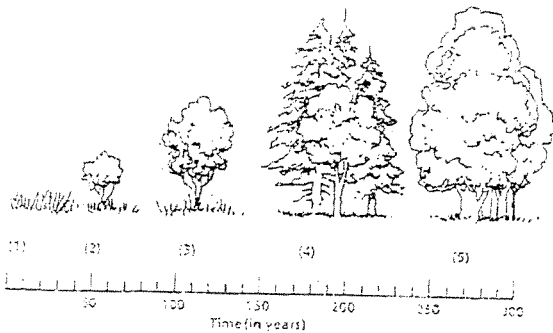
CONCRETE MENAGERIE, THOUSANDS

15. The finches on the Galapagos Islands have different shaped beaks to enable them to eat different foods, or different parts of the same food. What is the name of the process that led to the different shaped beaks?

ADAPTIVE RADIATION

16. Give one example of a foreign plant species in BC and one example of a foreign animal species. How have these organisms impacted native species?

17.



What does this picture represent? Would it be primary or secondary? Explain.

18. Compare organic and inorganic matter.

CARBON + HYDROGEN
NONE! (NOT OF BIOLOGICAL ORIGIN)

19. Identify the organic molecule that matches the following descriptions: a) forms structural components of energy; b) provide immediate energy; c) controls body functions; d) provides insulation against heat loss; e) long-term storage of energy

20. Compare photosynthesis and cellular respiration. How are they different? How are they connected?

21. Look at the carbon cycle diagram on p.87 (or in your data booklet). Use your finger to trace the path of a carbon atom over time. Give an example of a carbon sink and a carbon reservoir.

22. There is a good chance that the carbon atoms in your body used to be in a prehistoric plant that existed during the dinosaur age! Explain how they may have got from the prehistoric plant to your cells.

23. What is the "greenhouse effect"? How have human activities led to an enhanced greenhouse effect?

TRAPS HEAT FROM SUN.

24. Look at the nitrogen cycle diagram on p.93 (or in your data booklet). Use your finger to trace the path of a nitrogen atom over time. If possible, identify what the nitrogen is bonded to and what it is called. For example, NH_3 , ammonia, is released from a volcano...

25. What role do legumes, alders and lupins play in the nitrogen cycle?] THEM HAVE SYMBIOTIC BACTERIA (N-FIXING)

26. Draw a simple diagram of the nitrogen cycle using the following terms: nitrogen fixation, nitrification, decomposition, denitrification

27. What is the main difference between the phosphorus cycle and the other biogeochemical cycles?

28. Explain the difference between the short and long phosphorus cycles.

29. What is the role of mycorrhizae? - ↑ SOLUBILITY OF PHOSPHATE, MAKING IT AVAILABLE FOR THE PLANT.

30. How does the phosphorus in animals re-enter the phosphorus cycle?
FAECES.

31. Give some examples of how weather related phenomena and geological events can affect ecosystems.
TUNAS, TACS, TORNADOES.

32. What is acid rain and how does it form?

$\text{SO}_2 + \text{NO}$ FORM W/ RAIN PARTICLES.

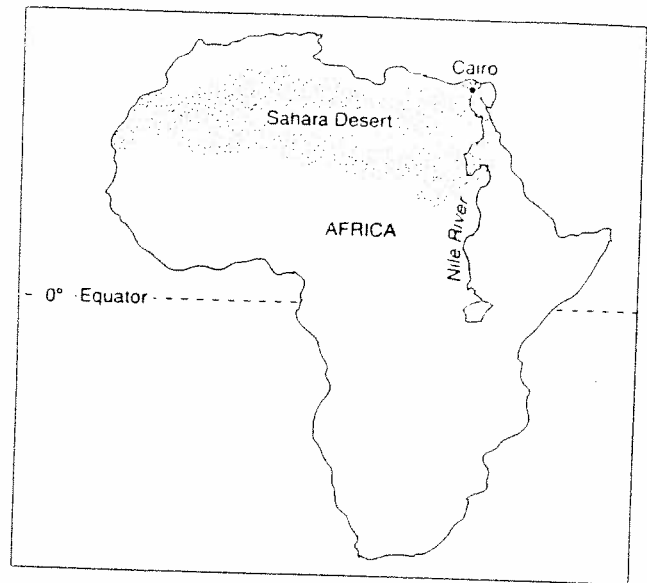
33. Review Tables 1,2 and 3 from Section 5.2 and be able to give some examples of air, water and land pollution.

34. DDT was used as a pesticide. It leached through the soil into water. In the water it was present in a concentration of 0.000003 ppm (parts per million). In fish-eating birds it was found in concentrations over 25 ppm. Why is it so much more concentrated in the birds? What is this process called?

35. What are heavy metals and why should we be concerned about them in our environment?

BIOACCUMULATION

ARSENIC }
CADMIUM } DANGEROUS TO
ALUMINIUM } RESP. ENVIRONMENT
COPPER. } DIG., EXERCISE
SYSTEMS



1. Which of the following is an example of a biome?
 - A. the Equator
 - B. the Nile River
 - C. the city of Cairo
 - D. the Sahara Desert

2. Which of the following is a characteristic of the boreal forest biome?
 - A. coniferous trees
 - B. a permafrost layer
 - C. a constant temperature throughout the year
 - D. annual rainfall of more than 250 cm per year

3. An ecologist wants to gather information about a stream along a mountainside. Which of the following is a biotic factor?
 - A. water flow rate
 - B. mineral deposits
 - C. water temperature
 - D. variety of life forms

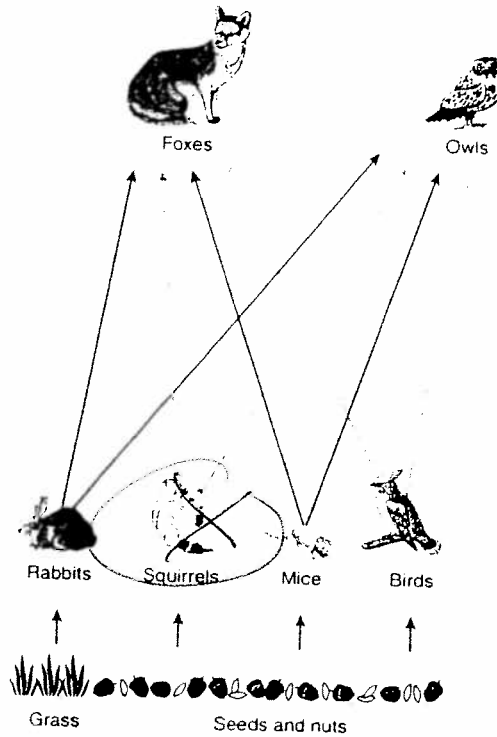
Use the following image of a honeybee pollinating a flower as it gathers food to answer question 4.



From "America's Beekeepers' Hives," May 1993, National Geographic magazine

4. What relationship exists between the honeybee and the flower?
 - A. predation
 - B. parasitism
 - C. mutualism
 - D. commensalism

Use the following illustration to answer question 5.



5. Which of the following is likely to occur if a large number of squirrels are removed from the area?

- A. an increase in the fox population
- B. an increase in the owl population
- C. a decrease in the plant population
- D. a decrease in the rabbit population

6. Which of the following contain the greatest carbon stores in gigatonnes of carbon?

- A. marine life
- B. oil and gas deposits
- C. organic matter in soil
- D. marine sediments and sedimentary rocks

7. Which of the following elements have these three characteristics in common?

- dissolved in water
- stored in sediments
- present in the atmosphere

- A. carbon and nitrogen
- B. carbon and phosphorus
- C. nitrogen and phosphorus
- D. carbon, nitrogen and phosphorus

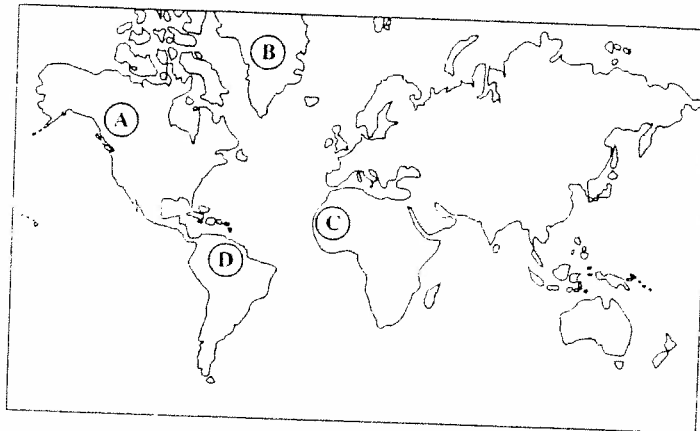
8. Which of the following do nitrogen fixation and the decomposition of organic wastes have in common?

- A. Both enrich the soil.
- B. Both are part of the carbon cycle.
- C. Both decrease levels of nitrogen in the soil.
- D. Both are responsible for increased levels of carbon dioxide in the atmosphere.

9. Which of the following best explains the distribution of temperate rainforests?

- A. warm, moist air near the equator
- B. intense solar radiation causing arid conditions
- C. presence of large numbers of small herbivores
- D. presence of coastal mountains causing high annual precipitation

10. In which of the following locations is the annual precipitation the greatest?



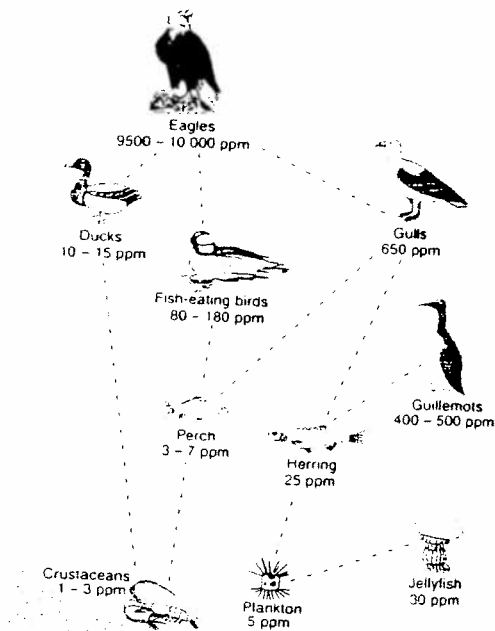
A. A

B. B

C. C

D

Use the following diagram of PCB levels in a community to answer question 11.



11. Which statement best explains the relatively high level of PCBs in eagles compared to those of guillemots?

- A. Both species are carnivores.
- B. Guillemots eat more herring than eagles do.
- C. Levels of PCBs are higher in marine environments.
- D. Eagles occupy a higher trophic level than guillemots.

Use the following article to answer question 12.

"Sorry, no eel pie today"

Eel pie, jellied eels, eel Florentine. The eels used in these dishes used to be abundant in Europe's ponds and streams but they may soon disappear.

The problem is that it only takes small amounts of polychlorinated biphenyls (PCBs), a common chemical pollutant, to kill eel embryos. Most European eels already have enough PCBs in them to stop them from reproducing.

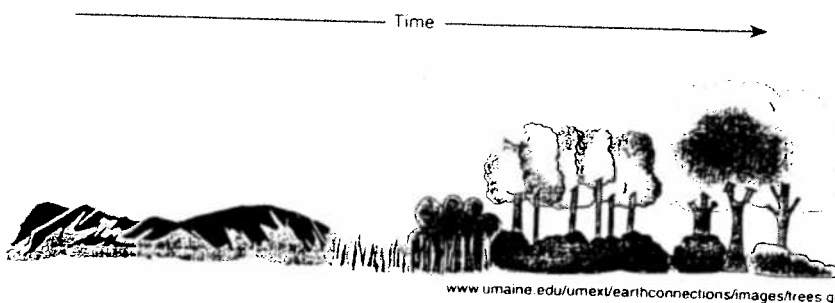
Overfishing was previously thought to have been the cause of the crash in the eel population. However, now that spawning has been observed in captivity, it has been found that a mother eel transfers PCBs from her body fat to her eggs. As a result, eel embryos die even when their mothers have PCB levels considered safe for human consumption.

Adapted from *New Scientist Print Edition*, March 11, 2006.

12. Which of the following is responsible for the observed decrease in the European eel population?

- A. overfishing
- B. loss of spawning grounds
- C. PCB concentrations in eel eggs
- D. increased predation on eel eggs

Use the following diagram of change over time to answer question 13.

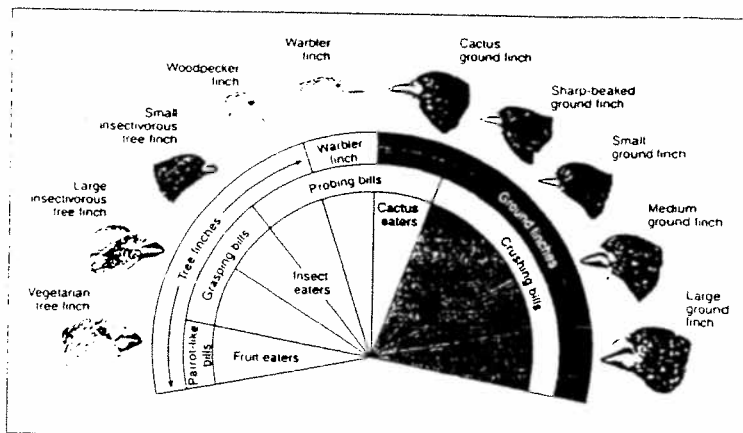


www.umaine.edu/umex/earthconnections/images/trees.gif

13. The diagram illustrates which of the following?

- A. biodegradation
- B. natural selection
- C. adaptive radiation
- D. ecological succession

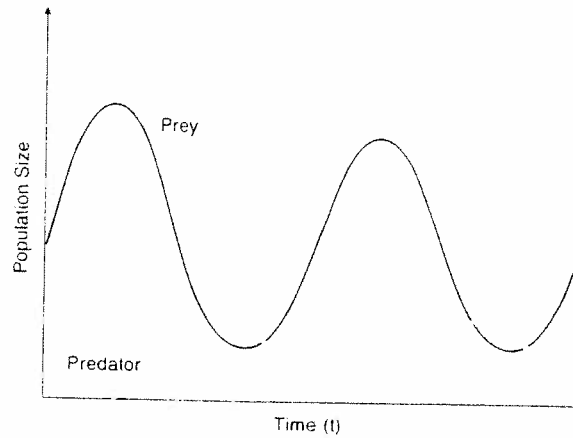
Use the following diagram to answer question 14.



14. The finches on the Galapagos Islands are different from island to island because of which of the following?

- A. different ages
- B. different sizes
- C. different predators
- D. different food sources

Use the following graph showing the relationship between predator and prey to answer questions 15 and 16.



15. The increase in the predator population size lags behind the increase in the prey population size.

- A. The statement is supported by the graph.
- B. The statement is refuted by the graph.

C. The statement is neither supported nor refuted by the graph.

16. Which of the following situations contributes to the shape of the graph?

I	When the prey population is small, the predators have more difficulty capturing food and their population starts to decline.
II	In response to predator decline, the prey population starts to increase.
III	Both predator and prey populations increase until the increased number of predators causes the prey population to decline.
IV	As the predator population increases and eats more prey, the reduced prey population will lead to starvation among predators.

- A. I and II only
- B. I and IV only
- C. II and III only
- D. I, II, III and IV

Use the following article to answer question 17.

Were Volcanoes the Crucible of Life?

New research by scientists shows that volcanoes produce large quantities of biologically available nitrogen.

Some bacteria and fungi have evolved the ability to fix nitrogen themselves, and these biological processes, along with mankind's activities (such as the burning of fossil fuels), are the major sources of fixed nitrogen in present-day ecosystems.



Where did the nitrogen that enabled life to evolve come from in the first place? Previously, lightning and asteroid impacts have been suggested as the major fixed nitrogen sources in the Earth's atmosphere of about three billion years ago; volcanism had not previously been thought of as an important process.

New work shows that the high temperatures associated with volcanic activity might also have played an important role in helping to fix nitrogen. Higher levels of fixed nitrogen were found in volcanic plumes than in the surrounding air.

This shows that the heat from volcanoes allows the nitrogen and oxygen in the atmosphere to react together to form fixed nitrogen. The results suggest that volcanism may have been at least as important as lightning and asteroid impacts in converting atmospheric nitrogen into fixed nitrogen on the early Earth.

Adapted from <http://131.111.150.52/news/press/dpp/2004100402>, 4 October 2004.
Photo: <http://www.arenal.net/costa-rica-screensaver/arenal-volcano-screensaver.jpg>

17. Which of the following describes nitrogen fixation in an active volcanic environment?
- A. Heat from the volcano provides the energy to fix nitrogen.
 - B. Plants growing on cooling ashflows have the ability to fix nitrogen.
 - C. The burning of organic material on the slopes of volcanoes fixes nitrogen.
 - D. Bacteria and fungi on the flanks of the volcano have the ability to fix nitrogen.
18. Which of the following natural phenomena is most likely to cause widespread disease in human populations?
- A. fire
 - B. El Niño
 - C. flooding
 - D. timber pest infestation
19. Which of the following explains why foreign species may be successful in a new ecosystem?
- A. Predators of the foreign species are absent.
 - B. The foreign species prevents natural selection.
 - C. A native species becomes a parasite on the foreign species.
 - D. The foreign species causes adaptive radiation of native populations.

Use the following article to answer questions 20 and 21.

In March of 1989, the *Exxon Valdez* oil tanker spilled millions of litres of crude oil into the waters of Prince William Sound in Alaska. The spill killed many organisms, including an estimated 250 000 seabirds, 2800 sea otters, 300 harbour seals, 250 bald eagles and as many as 22 killer whales. Billions of salmon and herring eggs, as well as tidal plants and animals, were also smothered in oil.

Most of the fish and wildlife species that were affected have not fully recovered. Of the many species affected by the spill, only the river otter and bald eagle have returned to previous levels.

Killer whales, harbour seals and common loons have shown little sign of recovery in the area. Several other species, including sea otters and Pacific herring have made significant progress toward recovery, but are still not at the levels seen before the incident.

20. Which of the following organisms recovered most quickly after the oil spill?
- A. harbour seals and salmon
 - B. river otters and bald eagles
 - C. killer whales and bald eagles
 - D. sea otters and Pacific herring
21. Which of the following describes the initial impact of the oil spill on the ecosystem?
- A. Several animal species became extinct.
 - B. Adaptive radiation occurred in the seashore community.
 - C. There was an increase in the rate of ecological succession.
 - D. There was a reduction in the population of certain organisms.

Chemistry Review

Elements are substances that cannot be broken down into simpler materials

Compounds are substances that are formed from two or more elements

Mixtures are combinations of two or more pure substances that do not combine chemically

Every atom is composed of 3 kinds of subatomic particles:

The atomic number is the: *PROTONS*

The mass number is: *N. + PROTON*

An isotope is: *SAME PROTONS, DIFFERENT # NEUTRONS*

The atomic mass is: *NEUTRON + PROTON. A.V.G. MASS OF ATOMS IN ELEMENT.*

Bohr diagrams show the arrangement of: *ELECTRONS*

An element with an atomic number of 9 is: *FLUORINE*

Its Bohr diagram would look like:

No. Of protons	<i>9</i>
No. Of electrons	<i>9</i>
No. Of neutrons	<i>10</i>

The Bohr diagram of this atom's ion would look like:

An ion can be made by:

Chemical families are: *Groups of elements w/ same characteristics*

Alkali metals form *+ve* ion because *TRANSFER e^-* . This family is located:

Alkaline Earth Metals form *+ve* ions because *"*. This family is located:

Halogens form *-ve* ions because *"*. This family is located: *Gr. 7.*

Noble Gases don't *FORM* ions because *THEY ARE COVALENT*. This family is located: *Gr. 8.*

How many neutrons does the average copper atom have? Explain

34.5 - ISOTOPES = A.V.G.

A chemical bond is a force that CONNECT ATOMS TOGETHER

Ionic bonds form between: N.M + M. Electrons are Given / TAKEN

Covalent bonds form between: N.M + N.M Electrons are SHARED

Diatomic molecules are: PAIRS ATOMS.

The elements that form diatomic molecules are: N.M.

- Three types of ionic bonds: Binary ionic compounds
- ionic compounds with multivalent elements
 - ionic compounds with polyatomic ions

The page in your data booklet of polyatomic ions:
Examples of positive polyatomic ions: (name and formula)
The steps in writing formulas are:

Write name of compound or formula for compound (all ionic)

- Iron (III) oxide Fe_2O_3
- Ammonium chloride NH_4Cl
- Nickle (II) sulphide NiS
- Magnesium phosphate $Mg_3PO_4_2$
- Calcium nitride Ca_3N_2
- Aluminum nitrate
- NaF Sodium Fluoride

CaCO₃ Calcium carbonate
 NaOH Sodium Hydroxide

Molecular compounds are: Poor conductors of electricity
 (non-) when dissolved in H₂O
 (non-)

Steps to writing molecular formulas are;

Formulas for :

Di hydrogen monosulphide H₂S
 Tetraphosphorus hexoxide P₄O₆
 Arsenic pentachloride AsCl₅

I₄O₉ Tetra Iodic nona oxide
 BF₃ Boron trifluoride
 N₂O₃ Dinitrogen trioxide

The charge on Cu in copper (I) chloride is +

CaCl₂ and NaCl both contain chloride ions. Explain why different number of chloride ions are needed to make each compound.

	Behaviour in Water	Range on pH scale	Example (chemical formula and name)
Acids	Release H ⁺	1 - 6	HCl
Bases	" OH ⁻	8 - 14	NaOH

Inorganic compounds are: Opposite

Organic Compounds are: Carbon High to

pH Scale power of Hydrogen (How many H in there!)

The acid name for H_2SO_4

Sulfuric Acid

Lewis diagrams can be drawn for molecules. They illustrate how atoms come together to form

Molecular bonds. _____ bonds CAN also be drawn but this is normally not done.

Dots are arranged around an element's symbol that represents the valence EL.

The octet rule is;

Maximum 8 on outside ring.

Lone electron pairs are:

Bonding pairs are:

Draw a Lewis diagram for: F, O

F_2O

According to the octet rule, how many more electrons does the fluorine atom need to complete its valence shell?

Draw the structural formula for F_2O

What is so special about Carbon?

4 valence e.,

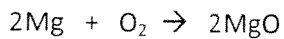
What is a hydrocarbon?

many bonding sites!

Simplest organic compounds

Draw the structural formula for C_2H_6





What are the reactants?

What are the products?

How does this follow the Law of Conservation?

Nothing is created nor destroyed.

Write the balanced reaction for the following; State what type of reaction each is

Zinc + hydrochloric acid \rightarrow zinc chloride + hydrogen

SINGLE R.

Chlorine + potassium bromide \rightarrow potassium chloride + bromine

SINGLE R.

Water \rightarrow hydrogen and oxygen

DECOMPOSITION

Silver nitrate + sodium chloride \rightarrow silver chloride + sodium nitrate

DOUBLE R.

Given: $6(\text{NH}_4)_2\text{SO}_4$

How many: Molecules? *6*

Atoms of H? *48*

Atoms of S? *6*

Total number of atoms???

Atoms of N? *12*

Atoms of O? *84*

Using A,B,C,and D as well as H for acid and OH for Base write the general form for each of the following. Synthesis has been done for you.

Synthesis $A + B \rightarrow AB$

Decomposition

Single Replacement

Double Replacement

Acid-Base Neutralization

Combustion

• METAL OXIDES Form BASIC
Solutions In H₂O

Indicators are:

7.203

• NON METAL OXIDES Form ACIDS

Indicator	Colour	In Acid	In Base
Phenolphthalein			
Bromothymol Blue			
Red Litmus Paper			
Blue Litmus Paper			

If a metal oxide such as MgO or CaO is placed in water then it will turn ~~Acidic~~^{BASIC} (acidic/basic). This can be determined by having a positive test in phenolphthalein as it will turn ~~colourless~~^{Pink}.

If a non-metal oxide is placed in water then it will turn ~~Basic~~^{ACID} (acidic/basic). This can be determined by having a positive test in bromothymol blue as it will turn ~~yellow~~^{Yellow}.

~~POST OXIDES ARE ACIDIC~~

Explain the Kinetic Molecular Theory.



CO₂ / N₂O₃

What are four ways to increase the rate of a chemical reaction? Explain each.

↑ Conc. of REACTANTS

↑ SURFACE AREA OF REACTANTS

TEMPERATURE ↑

CATALYST.

Practice chemical formula writing and balancing p. 238 #5,6,7,8

Show Answers!

Radiation

- Describe the relationship between frequency and wavelength of electromagnetic radiation. What do all electromagnetic radiations have in common?
- Consider the imaginary nuclei with symbols A, B, C, and D written below. Use them to answer questions a-e which follow.

14	15	18	15
A	B	C	D
7	7	8	9

- What is the atomic mass of A? What does this mean? *14 (p+n)*
- What is the number of neutrons in B? How did you determine this? *(8)*
- What is the atomic number of C? What does this mean?
- Which is likely to be radioactive? A or B? Why? *B: more unstable nucleus*
- The letters that must represent different isotopes of the same element are
 i) A, B ii) C, D iii) B, D iv) A, B, D

3. From the list below, identify the symbols used to describe alpha, beta and gamma rays.

a) 0	b) +1	c) 0	d) 4	e) 0
e	e	e	He	α
-1	0	+1	2	0

3. Consider the radioactive nucleus $^{19}_8\text{O}$ that results from beta decay

- The complete symbol for the nucleus that results from its decay is
 i) $^{19}_9\text{O}$ ii) $^{19}_7\text{N}$ iii) $^{19}_9\text{F}$ iv) $^{18}_8\text{O}$

O	N	F	O
9	7	9	8

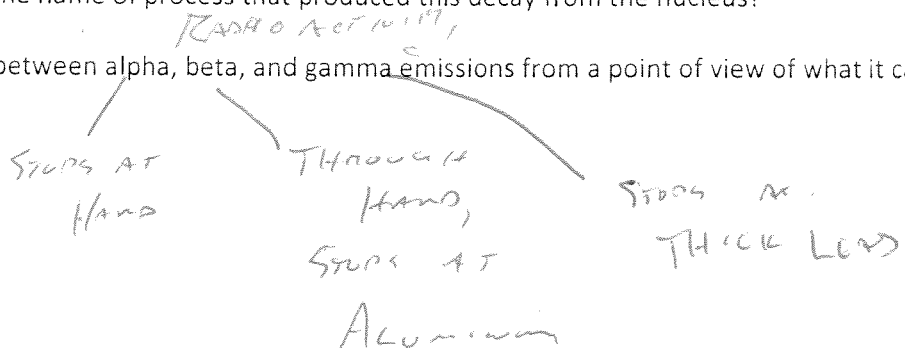
b) The complete symbol of the ray emitted from this decay is

- 0
- 1
- 0
- 4
- 0

e	e	e	He
-1	0	+1	2
			-1

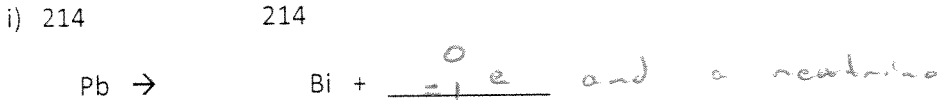
c) What is the name of process that produced this decay from the nucleus?

4. State the differences between alpha, beta, and gamma emissions from a point of view of what it can penetrate (go through).



An UNSTABLE NUCLEUS THAT EMITS RADIATION IS UNDERGOING RADIOACTIVE DECAY.

5. Complete the following nuclear decay reactions correctly by filling in the blank.



LOSSES ENERGY

322
Pb

6. State some negative effects of radiation. State some positive effects of radiation

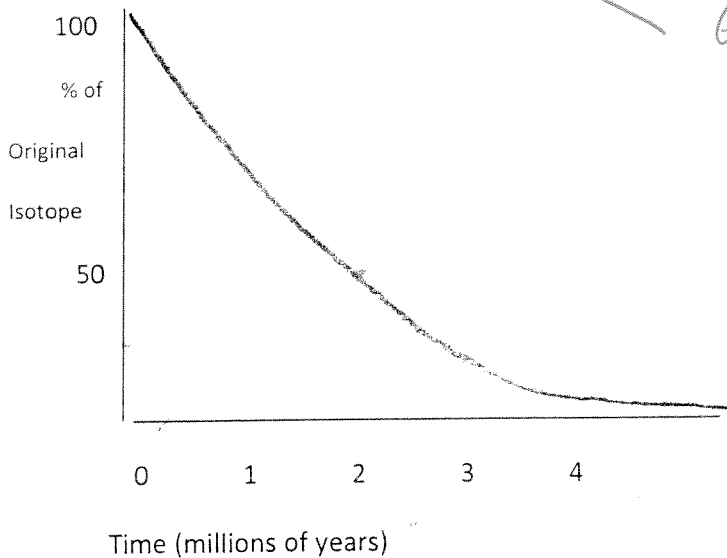
7. Radioactive dating is used frequently by archeologists and geologists to date fossils and rocks. This is often referred to as **RADIOMETRIC DATING**. Use your data booklet half-lives table to answer and explain the following questions.

Which radioisotope would not be useful in radiometric dating when

- a. testing materials that were once living? Potassium / Carbon.
- b. testing inorganic materials (matter that has never been alive)
- c. dating rocks older than 1 billion years old such as meteorites? Potassium 40
- d. dating materials much younger than 1000 years old?

RADIATION,
VIOLET
LIGHT,
INFRARED
LIGHT,

8. Decay Graph of a Radioactive Isotope



Gamma rays,
UV rays,
X rays } Harmful

Gamma rays are NOT PARTICLES B/C THEY DO NOT HAVE MASS

- a. What is the half-life of the element? 2 mill. approx.
- b. After two half-lives, what age would the sample be? 3 million Loss of Energy,
- c. How many complete half-lives has the sample gone through after 60 million years? ONLY
- d. What percentage of daughter material is present after 10 million years?

9. Explain the difference between fission and fusion. TOGETHER

10. What are the roles of moderators and control rods during nuclear fission? SPLIT TO CONTROL THE RATE of DECAY.

Key i.v.

5. Write the following chemical formula

- a) ammonium chloride NH_4Cl
- b) potassium permanganate $KMnO_4$
- c) calcium phosphate $Ca_3(PO_4)_2$
- d) iron (III) sulfate $Fe_2(SO_4)_3$
- e) ammonium hydroxide NH_4OH
- f) sodium nitrate $NaNO_3$
- g) lithium hypochlorite $LiClO$
- h) barium silicate $Ba(SiO_4)$
- i) potassium cyanide KCN
- j) lead (IV) phosphate $Pb_3(PO_4)_4$

6. Name the following chemical compound.

- a) $Ba(CH_3COO)_2$ barium acetate
- * b) $Sn(Cr_2O_7)_2$ tin (IV) dichromate
- c) Na_2SiO_3 sodium hypsilicate
- d) $NH_4H_2PO_4$ ammonium dihydrogen phosphate
- e) Ag_2SO_4 silver sulfate
- f) $(NH_4)_2SO_5$ ammonium sulfite
- g) $Cu(NO_3)_2$ copper (II) nitrate
- h) $KClO_2$ potassium chlorite
- i) $Au_2(HPO_4)_3$ gold (III) monohydrogen phosphate
- * j) $Fe_2(S_2O_3)$ iron (IV) thiosulfite/phosphite

7. Write the following chemical formula.

- a) sodium sulfite Na_2SO_3
- b) calcium permanganate $Ca(MnO_4)_2$
- * c) iron (III) nitride FeN
- * d) tin (IV) oxide SnO_2
- e) potassium hydroxide KOH
- f) barium phosphate $Ba_3(PO_4)_2$
- g) uranium (IV) nitrate $U(NO_3)_4$
- h) aluminum acetate $Al(CH_3COO)_3$
- i) silver nitrate $AgNO_3$
- j) nickel (III) bisulfate $Ni(HSO_4)_3$

8. Name the following compounds.

- a) NH_4CH_3COO ammonium acetate
- b) $Al_2(CrO_4)_3$ aluminum chromate
- c) $BaSeO_4$ barium selenate
- * d) $NiSO_4$ nickel (II) sulfate
- e) KIO_3 potassium iodate
- f) $Fe(H_2PO_4)_2$ iron (II) dihydrogen phosphate
- g) $Cu(HC_2O_4)_2$ copper (II) binoxalate
- h) $Mn(ClO_4)_2$ manganese (II) perchlorate
- i) $Au_2(S_2O_7)_3$ gold
- * j) $PtHPO_4$ platinum (II) monohydrogen phosphate

Science 10
Naming and Writing Chemical Formulas II

Key L.V.

Name _____

Date _____

1. Write the following chemical formula

- | | | | |
|-----------------------|------------------------------------|----------------------|-------------------------|
| a) sodium chloride | <u>NaCl</u> | f) lithium oxide | <u>Li₂O</u> |
| b) magnesium sulfide | <u>MgS</u> | g) potassium nitride | <u>K₃N</u> |
| c) strontium iodide | <u>SrI₂</u> | h) barium chloride | <u>BaCl₂</u> |
| d) beryllium fluoride | <u>BeF₂</u> | i) sodium selenide | <u>Na₂Se</u> |
| e) calcium phosphide | <u>Ca₃P₂</u> | j) cesium oxide | <u>Cs₂O</u> |

2. Name the following chemical compound

- | | | | |
|----------------------|---------------------------|-----------------------------------|---------------------------|
| a) KI | <u>potassium iodide</u> | f) MgF ₂ | <u>magnesium fluoride</u> |
| b) BeCl ₂ | <u>beryllium chloride</u> | g) SrBr ₂ | <u>strontium bromide</u> |
| c) Na ₂ S | <u>sodium sulfide</u> | h) Li ₂ O | <u>lithium oxide</u> |
| d) K ₃ N | <u>potassium nitride</u> | i) Ca ₃ N ₂ | <u>calcium nitride</u> |
| e) Li ₂ S | <u>lithium sulfide</u> | j) BaI ₂ | <u>barium iodide</u> |

3. Determine the following chemical compounds

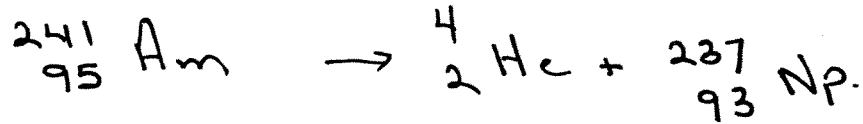
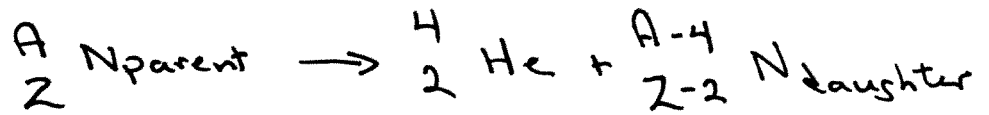
- | | | | |
|----------------------------|------------------------------------|-------------------------|------------------------------------|
| a) titanium (III) oxide | <u>Ti₂O₃</u> | f) iron (III) oxide | <u>Fe₂O₃</u> |
| b) tin (IV) chloride | <u>SnCl₄</u> | g) mercury (II) nitride | <u>Hg₃N₂</u> |
| c) zinc chloride | <u>ZnCl₂</u> | h) cobalt (III) sulfide | <u>Co₂S₃</u> |
| d) platinum (IV) phosphide | <u>Pt₃P₄</u> | i) gold (III) iodide | <u>AuI₃</u> |
| e) copper (II) chloride | <u>CuCl₂</u> | j) lead (IV) nitride | <u>Pb₃N₄</u> |

4. Name the following compounds

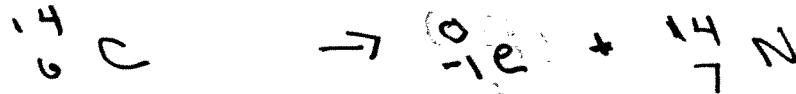
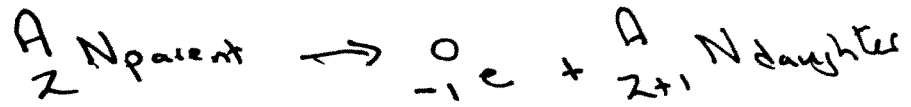
- | | | | |
|-----------------------------------|---------------------------------|-----------------------------------|------------------------------|
| a) Ni ₂ O ₃ | <u>nickel (III) oxide</u> | f) PbCl ₂ | <u>lead (II) chloride</u> |
| b) Co ₂ S ₃ | <u>cobalt (III) sulfide</u> | g) Hg ₃ P | <u>mercury (I) phosphide</u> |
| c) AgCl | <u>silver chloride</u> | h) Pt ₃ N ₄ | <u>platinum (IV) nitride</u> |
| d) CuCl ₂ | <u>copper (II) chloride</u> | i) CaCl ₂ | <u>calcium chloride</u> |
| e) Mn ₃ P ₂ | <u>manganese (II) phosphide</u> | AuBr ₃ | <u>gold (III) bromide</u> |

Types of Nuclear Reaction

1. Alpha

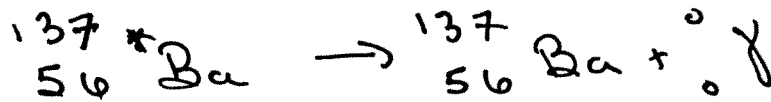


2. Beta

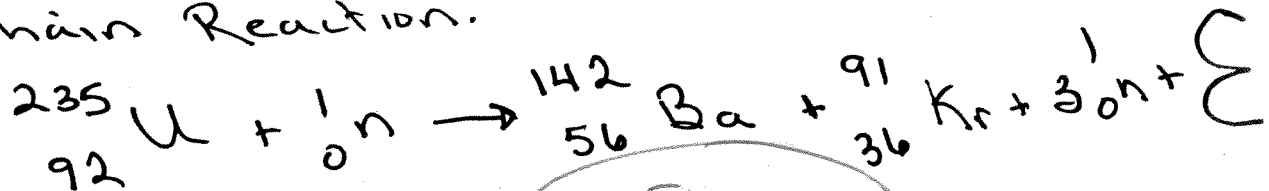


a neutron becomes a proton and an electron

3. Gamma



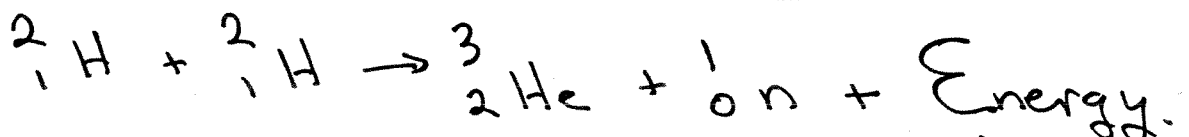
4. Fission is done under controlled conditions at a nuclear power plant. A neutron strikes Uranium to release Energy and more neutrons causing a Chain Reaction.



Fission means to:

SPLIT

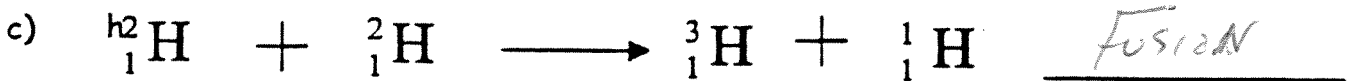
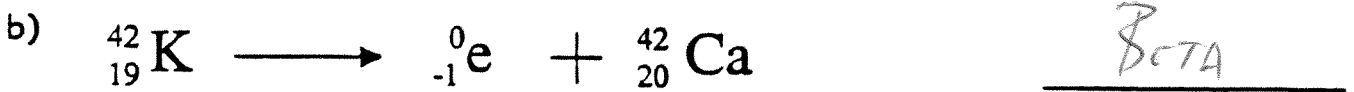
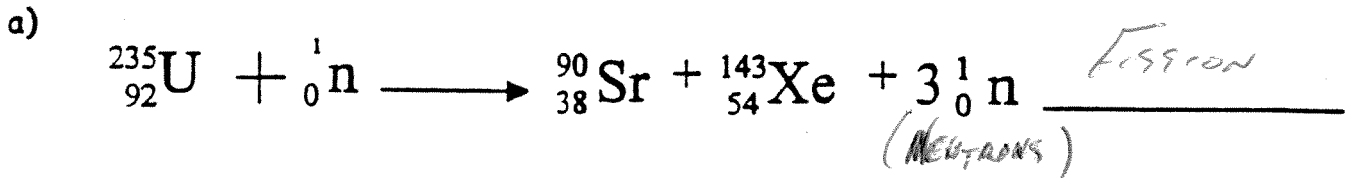
5. Fusion is when small atoms join together to form larger atoms and releases lots of E. Occurs in Sun and Bomb



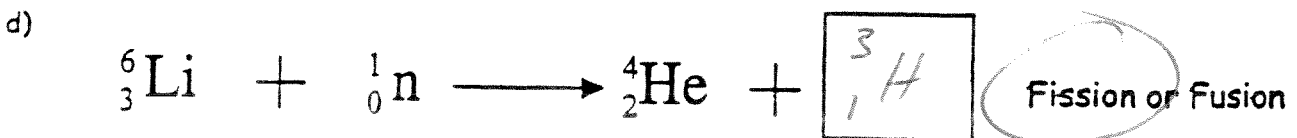
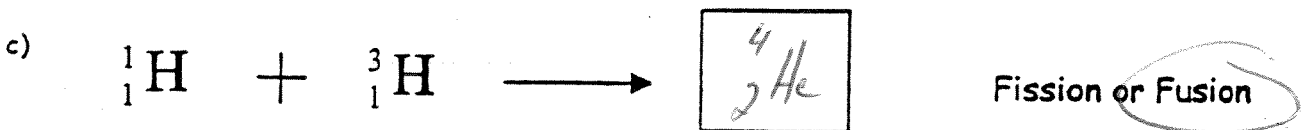
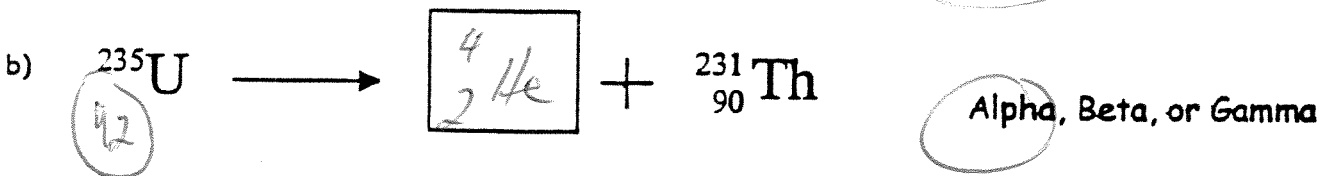
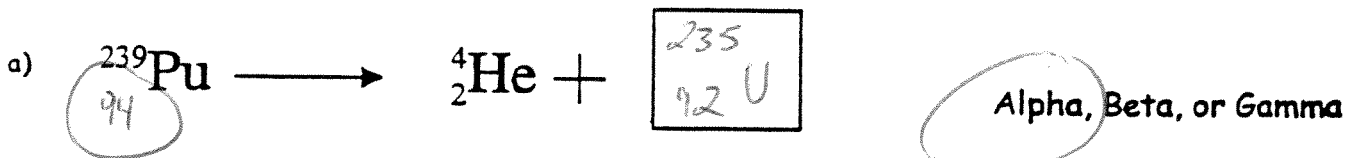
Artificial Radioactivity - occurs when a stable nucleus is bombarded with a neutron or an alpha particle

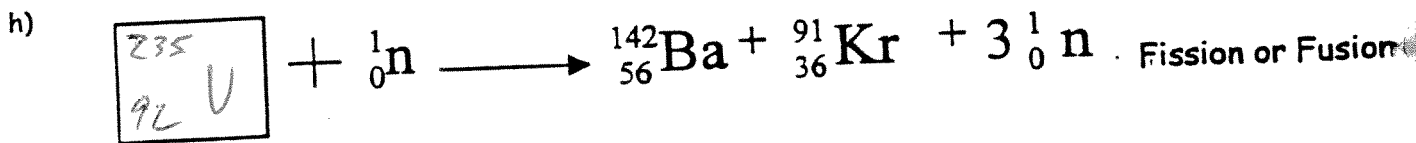
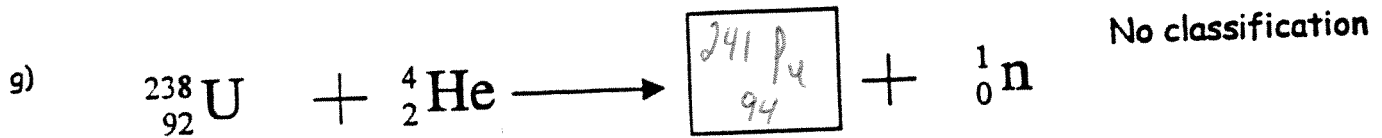
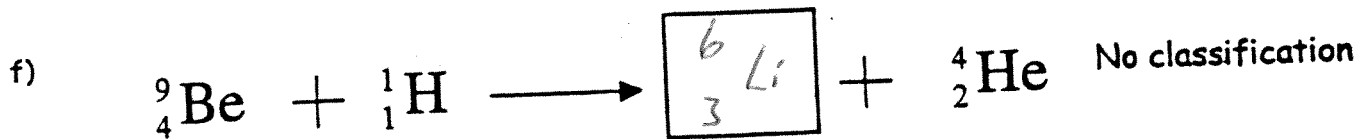
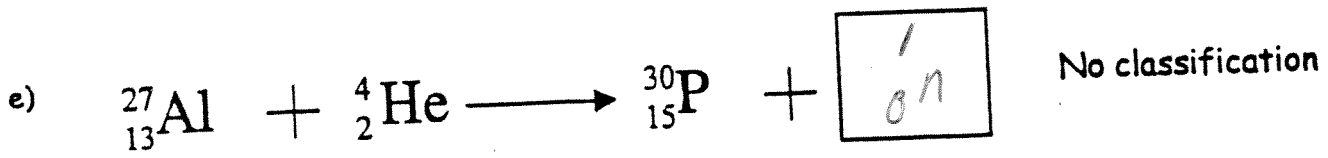


1. Classify the following reactions as nuclear fusion, nuclear fission, alpha or beta decay.

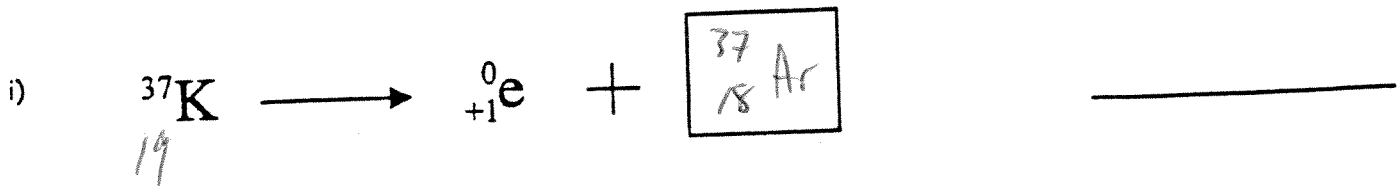


2. Predict the products of the following nuclear reactions and classify each reaction type as fission, fusion, alpha, or beta as required.





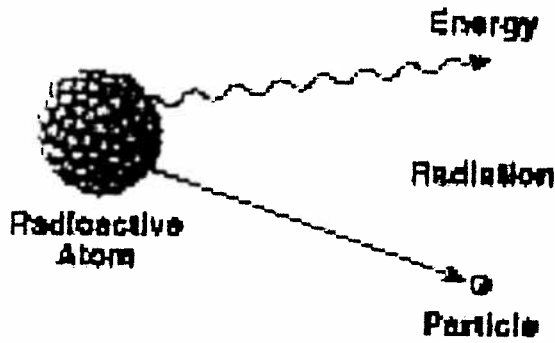
Bonus



The above reaction emits a type of particle we have not discussed.
Can you think of an appropriate name for this particle?

${}_{+1}^0\text{e}$ Positron

10.3 - Radioactive Decay



The nuclei of some isotopes are _____ and _____.
 A nucleus that emits radiation is undergoing _____ DECAY _____.

Method of Decay	Radiation	Electric Charge	What is it?	Characteristics
${}^4_2\text{He}$ ALPHA		+2	Atom Helium Nucleus	(slow) penetrating power slow
${}^0_{-1}\text{e}$ BETA		-1	an electron	penetrating power
Gamma DECAY		0	EMERGENCY LIGHT	LEAD

Writing balanced ~~nuclear~~ equations:

Two rules:

- 1) CHANGE ONLY COEFFICIENTS TO BALANCE
- 2) LEAVE OXYGEN UNTIL LAST IF THOSE ARE

Examples:

MANY OF THEM

(p. 237)



SEE