

Chemical Potential Energy Review Sheet

I. Types of Bonds

- A. What are the two kinds of strong bonds? Explain the difference between them.
- B. What are the two kinds of weak bonds? Explain the difference between them.
- C. Which kind of bond is a hydrogen bond?
- D. How does electronegativity play a role in the type of bond that forms between atoms?
- E. Draw what a typical ionic substance looks like at the atomic level.
- F. Draw what a typical molecule looks like at the atomic level (for example, water)
- G. A drop of water contains many water molecules. Draw a small sample of water molecules and indicate where there are strong bonds and where there are weak bonds in this group of molecules.
- H. Why are some substances hard and some soft?
 - I. Why do some substance have a high boiling point and some have a low boiling point?

II. Formulas and Equations (see back for examples)

- A. Know how to write formulas and names for substances. (Like the "Naming Various Substances Sheet")
- B. Know how to balance equations.
- C. Know how to take a paragraph description of a chemical reaction and write a balanced chemical equation to described what happened using chemical formulas.
- D. Be able to add states of matter to chemical equations and use the solubility rules.

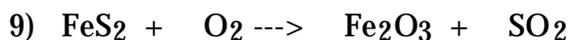
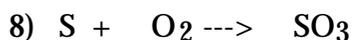
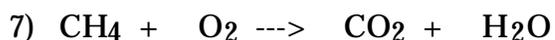
III. Chemical potential energy

- A. Which type of bond has more chemical potential energy - a strong bond or a weak bond?
- B. Will a chemical reaction that is spontaneous have a low or a high activation energy?
- C. Why are catalysts important for life? How do they work?
- D. Draw an energy diagram showing an exothermic and an endothermic reaction.

Fill in the table below: (Type of substance = ionic, molecular, acid, element)

1) Magnesium Sulfide	_____	_____
2) _____	_____	HNO ₃
3) Nitrogen	_____	_____
4) Hydrobromic acid	_____	_____
5) sulfur dioxide	_____	_____
6 Lead (IV) oxide	_____	_____

Balance the following:



Write the proper balanced chemical equations:

10) iron(III) bromide + ammonium sulfide ----> iron(III) sulfide + ammonium bromide

Type _____

11) calcium oxide + diphosphorus pentoxide ----> calcium phosphate

Type _____

12) aluminum + copper(II) chloride ----> aluminum chloride + copper

Type _____

13) calcium hydroxide + nitric acid ----> calcium nitrate + water

Type _____

Given the following descriptions, write balanced chemical reactions with states of matter (s),(l),(g), or (aq):

- 14) Some people have high iron in their water. This causes rust stains to form in their sinks and toilets. Several rust removing chemicals that you can buy contain hydrochloric acid which reacts with the rust. Write a chemical equation showing how hydrochloric acid reacts with rust (Fe_2O_3) to form iron(III) chloride and water.
- 15) Let's say you wanted to make a little hydrogen as part of a project to simulate the Hindenburg disaster. You know that when metals are combined with acids, hydrogen, and an ionic compound are produced. What would happen if you reacted the zinc from inside a new penny with the sulfuric acid that is in your car battery.
- 16) You're in that creative mood again and want to make one of those silly fake snow displays, the kind you have in water and shake so that the fake snow falls inside. One way to make fake snow is to make a precipitate. If you reacted calcium chloride solution with silver nitrate solutions, you would get a double replacement reaction. Would a precipitate form? Write out the chemical reaction below.