Name:_____
Blk:_____Date:_____

Chemistry 12
EQUILIBRIUM Lesson #3
PREDICTING WHETHER A REACTION IS SPONTANEOUS OR NOT

A _____ change is one that occurs _____ without any outside assistance.

THERE ARE TWO FACTORS THAT DETERMINES WHETHER A REACTION WILL BE SPONTANEOUS OR NOT:
1.
2.

ENTHALPY (H): the total kinetic and potential energies that exist in a system which is at constant pressure.

All chemical reactions can be categorized as either an endothermic or exothermic reaction. _____ **GIVE OFF** _____to the environment whereas _____**ABSORB** _____ from the environment.

EXOTHERMIC and **ENDOTHERMIC REACTIONS** are illustrated in the Potential Energy diagrams below:

CHEMICAL REACTIONS TEND TO FAVOUR THE SIDE WITH _____ _____!!!!

The tendency to _____ favours the side of the reaction containing the _____term (as the heat is on the "DOWNHILL" side of the PE diagram)

ENTROPY : the amount of *randomness* in a system

Randomness is the opposite to orderliness. When considering the **chemical phases** the most *orderly* is _____ whereas the most *random* is _____.

The randomness of the phases in order of **most random to least** is:

CHEMICAL REACTIONS TEND TO FAVOUR THE SIDE WITH _____ _____!!!!

If there is only a **SINGLE PHASE** in the entire chemical reaction, the side having the **most molecules** is favoured.
eg.

If a chemical reaction contains a **VARIETY OF PHASES** the side with the **most molecules** of the **most random** phase is favoured.
eg.

IF **MINIMUM ENTHALPY** and **MAXIMUM ENTROPY** both favour the _____
the reaction will _____.
eg. CH_4 (g) + O_2 (g)----> CO_2 (g)+ 2 H_2O (g) + 394 KJ

IF **MINIMUM ENTHALPY** favours the _____ and M**AXIMUM ENTROPY** favours the _____ the reaction will _____.
eg. C_2H_2 (g) + 2 Cl_2 (g) -----> $C_2H_2Cl_4$ (l) + 386KJ

IF **MINUM ENTHALPY** and **MAXIMUM ENTROPY** both favour the _____ the reaction will _____.
eg. 4 Au (s) + 3 O_2 (g) + 162 KJ -----> 2 Au_2O_3 (s)

SEAT WORK/HOMEWORK: EXERCISES 14-16 pgs 48 + 49
PLO's D7-D9