THE ENTHALPY GAME!!

Label each situation that represents a increase in enthalpy with endo and each situation that represents a decrease in enthalpy with exo.

1. Change of state from a liquid to a solid

2. An increase in chemical potential energy

3. Formation of CO_2 from its elements

4. mixing ammonium nitrate with water lowers the temperature of the water

5. in a reaction atoms rearrange their position to increase the net attraction for other atoms

6. $\Delta H^\circ = -185$ kJ/mol

7. $2H_2O \rightarrow 2H_2 + O_2$

8. an overall increase in bond energy (energy required to overcome a bond)

9. $\Delta H^\circ = 98$ kJ/mol

10. free moving atoms combine to form a compound spontaneously

11. change of state from a liquid to a gas

12. exothermic reaction

13. in a closed system (energy can neither enter nor escape) kinetic energy increases

14. $H_2O(l) + 10.5$ kcal $\rightarrow H_2O(g)$

15. in a reaction net attraction between atoms is lessened

16. $CH_4 + {}^3/_2O_2 \rightarrow CO_2 + H_2O$

17. endothermic reaction

18. a rock falls off a cliff

19. in a closed system potential energy increases

20. mixing NaOH(s) with water produces heat

21. The assembly of a lattice from free ions

22. The hydration of ions in solution

23. A dissolving process inwhich the hydration energy is greater than the lattice energy (the interaction between solvent and solute is stronger than the interaction within the lattice structure)

24. $CO + Cl_2 \rightarrow COCl_2$

25. The ionization of magnesium to form Mg^{2+} ($Mg \Longrightarrow Mg^{2+} + 2e^-$)

26. The vapourization of NaCl(s) to form free Na^{1+} ions and free Cl^{1-} ions (i.e. breaking the lattice energy).

27. The formation of a solution of a salt from water and the solid of the salt.

Summary: In the chart list as many different ways that you can determine if enthalpy has increased and list the counter statement for the decrease in enthalpy.

INCREASE IN ENTHALPY (ENDOTHERMIC)	**DECREASE IN ENTHALPY (EXOTHERMIC)**