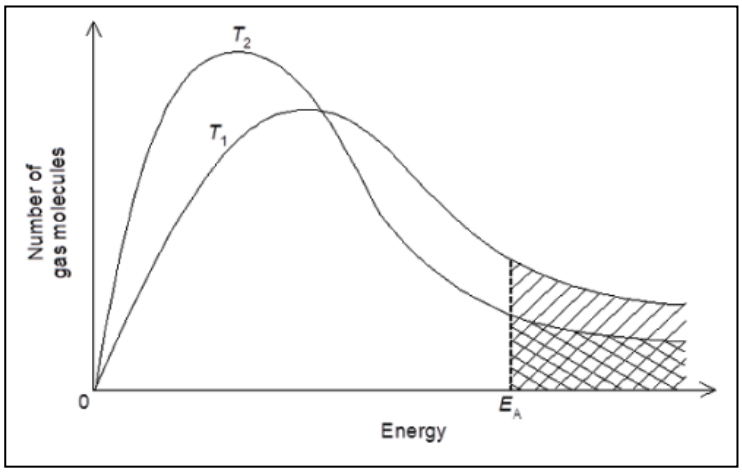
Friday Worksheet **Name: …….**

Chemical equilibrium worksheet 7

1) Consider the energy distribution graphs shown on the right. With reference to these graphs and the Particle theory, answer the following questions.

a) Explain why an increase in temperature increases the rate of a reaction.



b) Is the statement "All molecules have an increased kinetic energy at higher temperatures" true or false? Explain.

c) Which of the following increase with higher temperature? Explain

i. Activation energy.

ii. Average kinetic energy of particles.

iii. Frequency of collisions.

2) Consider the reaction below.

$2H_2(g) + O_2(g) \Rightarrow 2H_2O(g)$ $\Delta H = ?$

3.50 grams of hydrogen gas and 40.0 grams of oxygen gas were mixed and ignited. The energy released was captured and used to heat 2.300 kilograms of water at 25.0°C to a final temperature of 69.1°C.

a) Assuming no energy is lost, calculate the ΔH of the reaction above.

b) Given the following bond energies **H-H**, 436kJ/mol. **O=O**, 499 kJ/mol and O-H, 463 kJ/mol, draw an energy profile diagram on the set of axes on the right.

Clearly label the following.

- activation energy
- ΔH
- activation energy of the backward reaction.

$2H_2O(g) \Rightarrow 2H_2(g) + O_2(g)$