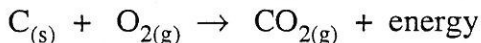


Name: Key  
 Blk: \_\_\_\_\_ Date: \_\_\_\_\_

**CHEMISTRY 12**  
**REACTION KINETICS SHORTANSWER REVIEW**

1. Carbon burns in air according to the following equation:



List four ways the rate of the above reaction could be increased.

powder C(s)  
 $\uparrow [CO_2]$   
 add a catalyst  
 $\uparrow$  temp. (1 marks)

2. A strip of magnesium was cut into 4 pieces, each of length 1.0 cm and mass of 0.00864 g. Each piece was placed into a test tube containing 5.0 mL of different concentrations of HCl. The time required for each piece of magnesium to be completely consumed was recorded:

TRIAL	[HCL] (M)	TIME (s)
1	0.50	200
2	1.0	38
3	3.0	12
4	6.0	6

a)  $\frac{0.00864g}{12 \text{ sec}} = 7.20 \times 10^{-4} g/s$

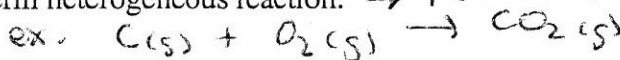
b) as  $[HCl] \uparrow$  the rxn rate  $\uparrow$

a) Calculate the rate of reaction for magnesium in 3.0 M HCl.

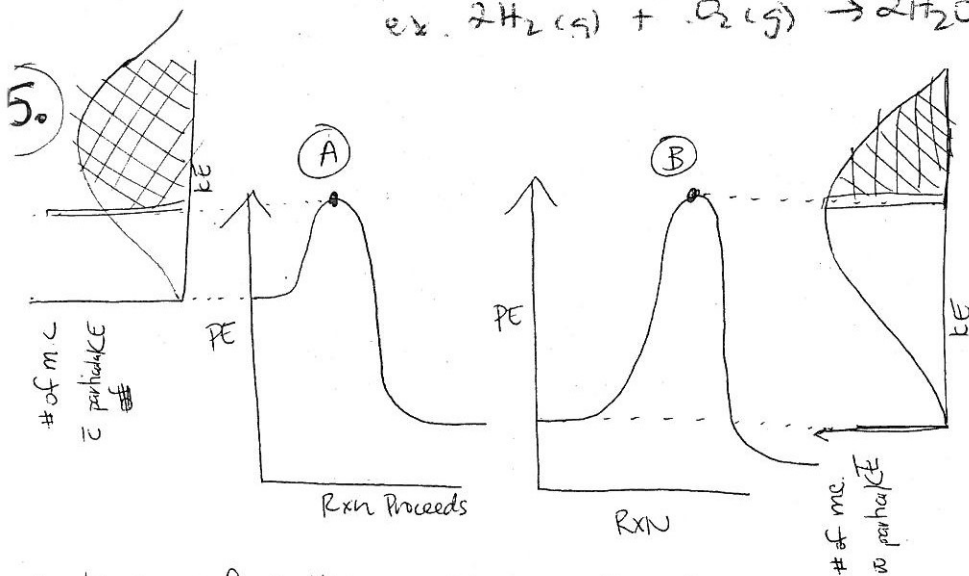
b) How does the [HCl] affect the reaction rate?

(1 marks)

3. Define the term heterogeneous reaction.  $\rightarrow$  reactants are in different states (1 marks)



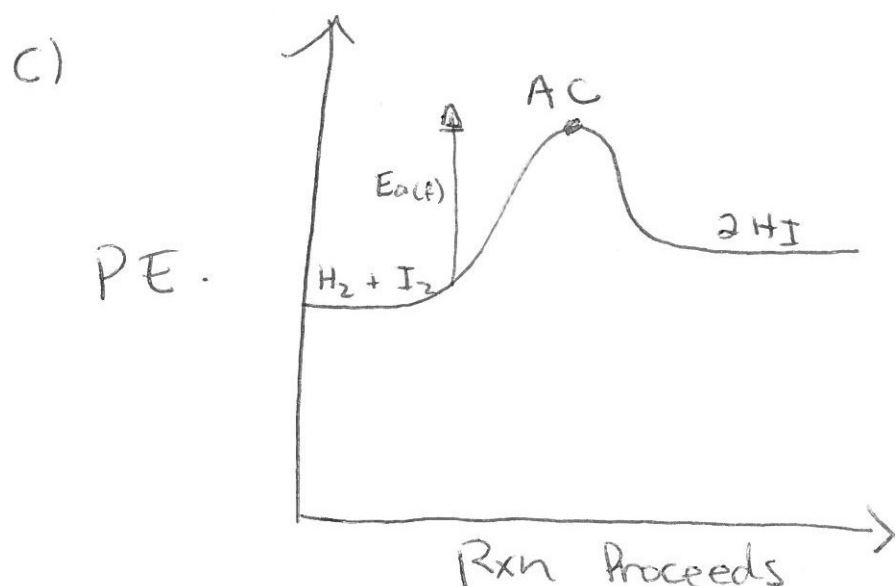
4. Define and give an example of a homogeneous reaction.  $\rightarrow$  reactants are in the same states (2 marks)



In terms of collision theory Rxn A will occur faster than B as more molecules have sufficient kinetic energy  $\therefore$  the likelihood of successful collisions increases.

b. a) As the reactants approach each other to form the AC the kinetic energy decreases as potential energy increases (due to the force of repulsion caused by approaching electrons). As the activated complex separates out into the products the potential energy decreases and kinetic energy increases.

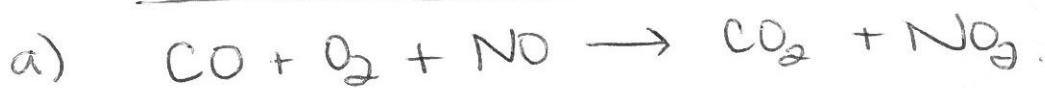
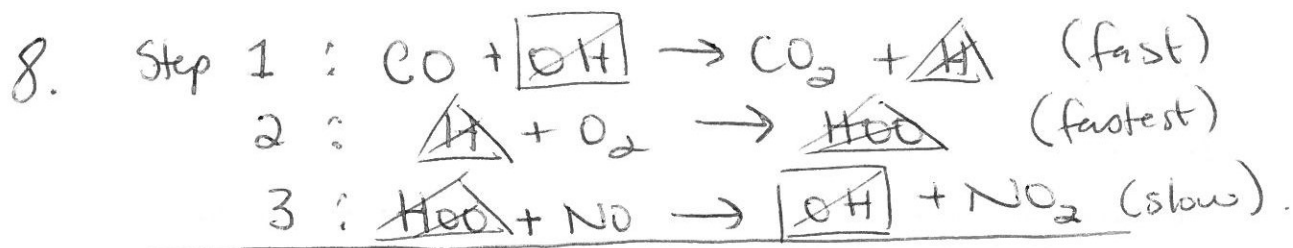
b). The energy required to break <sup>reactant</sup> bonds involves an increase in potential energy. The energy required to form the product bonds involves a decrease in potential energy. To reach the activated complex potential energy increases and because the overall reaction is endothermic the input of potential energy is more than the output of potential energy.



7. a)  $\Delta H = -394 \text{ kJ}$ .

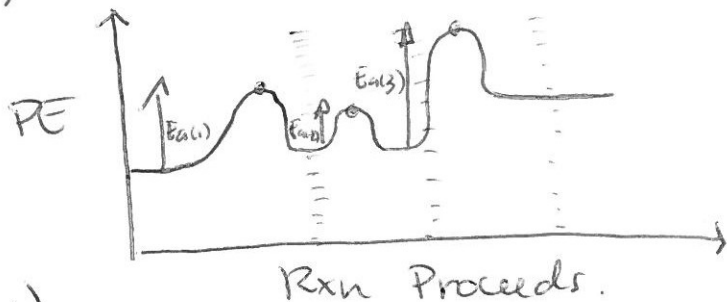
b) Because coal is a solid there is not enough particles with sufficient kinetic energy to cause effective collisions  $\therefore$  no reaction.

c) Coal dust  $\rightarrow$  the solid has increased surface area  $\therefore$  more particles  $\therefore$   $\uparrow$  likelihood of a successful collision  $\therefore$  rxn rate occurs. Also the spark,  $\uparrow$  temp  $\therefore$   $\uparrow$  successful collisions.



b) rxn intermediates : H, HOO

c)



d) Increasing the concentrations of those reactants not in the rate determining step (step #3) will not affect the overall rate.