## LE CHATELIER'S PRINCIPLE 1

1) Complete the table to show what would happen to the position of the following gas phase equilibria if the following changes were made. Tick the correct column in each case.

Equilibrium	Energy change (forward reaction)	Increase temperature			Increase pressure		
Equilibrium		moves left	no move	move right	moves left	no move	move right
$A(g) + 2 B(g) \rightleftharpoons X(g) + Z(g)$	exothermic						
$P(g) + Q(g) \rightleftharpoons 2 X(g)$	endothermic						
$A_2(g) \rightleftharpoons X(g) + Z(g)$	exothermic						
2 P(g) ⇌ 2 C(g) + D(g)	endothermic						

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_	i ilic ilyaloqcii		nocess is induc in the	s reaction shown below.	William 13 all equilibrium.

$$CH_4(a) + H_2O(a) \rightleftharpoons CO(a) + 3 H_2(a)$$
  $AH = +206 kJ/mo$ 

			$CH_4(g) + H_2O(g) \rightleftharpoons CO(g) + 3 H_2(g) \qquad \Delta H = +206  kJ/mol$
	a)	i)	If the temperature of this equilibrium was increased, what would happen to the yield of hydrogen?
		ii)	Explain your reasoning.
	b)	i)	If the pressure of this equilibrium was increased, what would happen to the yield of hydrogen?
		ii)	Explain your reasoning.
3)		Шуdг	ogen can also be made in the reaction shown below.
3)		riyui	CO(g) + H <sub>2</sub> O(g) $\rightleftharpoons$ CO <sub>2</sub> (g) + H <sub>2</sub> (g) $\triangle H = -42 \text{ kJ/mol}$
	a)	i)	If the temperature of this equilibrium was increased, what would happen to the yield of hydrogen?
		ii)	Explain your reasoning.
	b)	i)	If the pressure of this equilibrium was increased, what would happen to the yield of hydrogen?
		ii)	Explain your reasoning.