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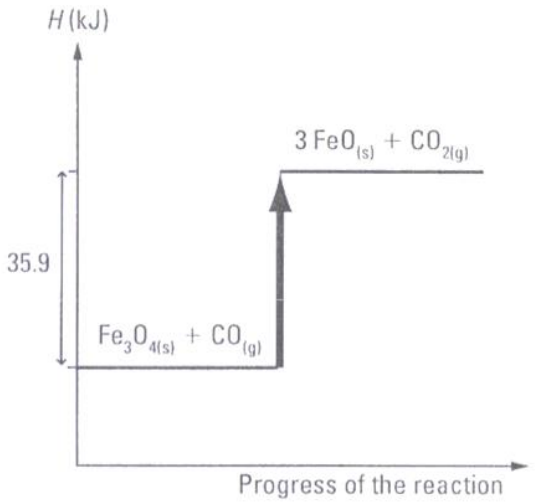
1. *a)* Endothermic
   b) Exothermic
   c) Exothermic
   d) Endothermic ?
   e) Exothermic

ASK:
Are we strengthening/forming bonds (EXO) OR weakening/breaking bonds (ENDO)

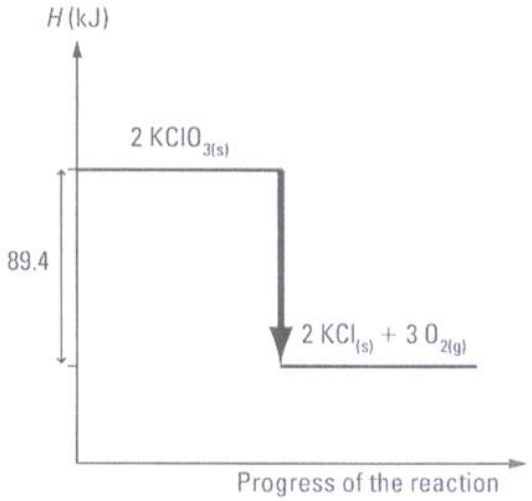
2. *a)* Endothermic
   b) Exothermic
   c) Exothermic
   d) Exothermic

3. *Answer:* b) *(Solid → Gas)*

4. *a)*



b)



5. *a)* 30°C
   b) 10°C
   c) $\Delta H_{\text{liquid condensation}} = 10\ \text{kJ/mol} - 20\ \text{kJ/mol} = -10\ \text{kJ/mol}$ *(Gas → Liquid) Strengthening/forming bonds (EXO)*
   d) $\Delta H_{\text{fusion (melting)}} = 41\ \text{kJ/mol} - 28\ \text{kJ/mol} = 13\ \text{kJ/mol}$ *(Solid → Liquid) weakening/breaking bonds (ENDO)*

For #6 a) assume the ΔH is in regards to the 2LiCl
b) assume the ΔH is in regards to the $1C_2H_6$

6. *a)* $2\,Li_{(s)} + 2\,HCl_{(g)} \rightarrow 2\,LiCl_{(s)} + H_{2(g)}\ \Delta H = -281\ \text{kJ/mol}$
   $2\,Li_{(s)} + 2\,HCl_{(g)} \rightarrow 2\,LiCl_{(s)} + H_{2(g)} + 562\ \text{kJ}$
   Exothermic reaction
   b) $2\,NH_{3\,(g)} + 2\,CO_{2\,(g)} \rightarrow C_2H_{6\,(g)} + 2\,NO_{2\,(g)}\ \Delta H = 861\ \text{kJ/mol}$

   $2\,NH_{3\,(g)} + 2\,CO_{2\,(g)} + 861\ \text{kJ} \rightarrow C_2H_{6\,(g)} + 2\,NO_{2\,(g)}$
   Endothermic reaction

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1. *Answer: a)* *(Liquid → Solid)*

2. *a)* −185.85°C
   b) −189.36°C

c) – 1.188 kJ/mol *(Liquid → Solid) Strengthening/forming bonds (EXO)*

d) – 6.447 kJ/mol *(Gas → Liquid) Strengthening/forming bonds (EXO)*