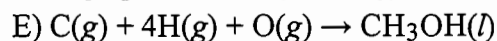
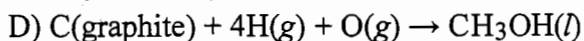
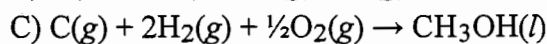
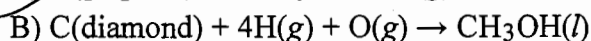
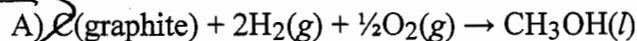
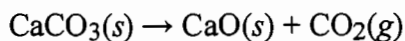


SHOW ALL WORK TO RECEIVE CREDIT.

1) Which one of the following equations represents the formation reaction of  $\text{CH}_3\text{OH}(l)$ ?2) Calculate the  $\Delta H^\circ_{\text{rxn}}$  for the decomposition of calcium carbonate to calcium oxide and carbon dioxide.

$$\Delta H^\circ_f[\text{CaCO}_3(s)] = -1206.9 \text{ kJ/mol}; \Delta H^\circ_f[\text{CaO}(s)] = -635.1 \text{ kJ/mol};$$

$$\Delta H^\circ_f[\text{CO}_2(\text{g})] = -393.5 \text{ kJ/mol}$$



$$\Delta H^\circ_{\text{rxn}} = \sum n\Delta H^\circ_{\text{products}} - \sum n\Delta H^\circ_{\text{reactants}}$$

$$= (-635.1 + (-393.5)) - (-1206.9) \text{ kJ}$$

$$\Delta H^\circ_{\text{rxn}} = 178.3 \text{ kJ}$$

3) Ethylene glycol, used as a coolant in automotive engines, has a specific heat capacity of 2.42  $\text{J}/(\text{g}\cdot\text{K})$ . Calculate  $q$  when 3.65 kg of ethylene glycol is cooled from  $132^\circ\text{C}$  to  $85^\circ\text{C}$ .

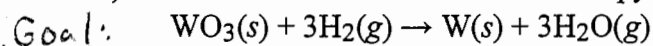
$$\frac{3.65 \text{ kg} \cdot 2.42 \text{ J}}{\text{g}\cdot\text{K}} \cdot (132 - 85)^\circ\text{C} = 415 \text{ kJ}$$

$$\Delta^\circ\text{C} = \Delta\text{K}$$

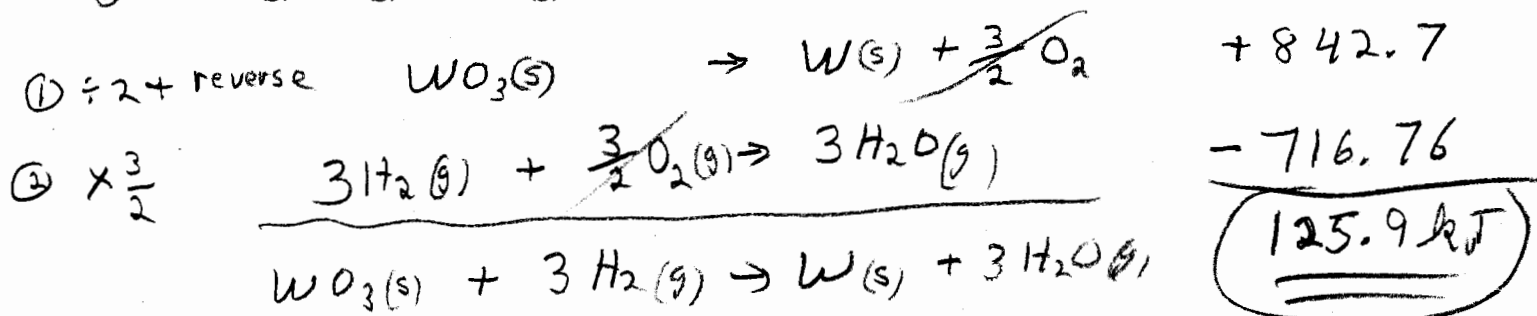
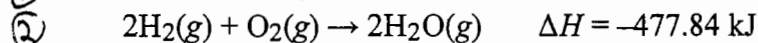
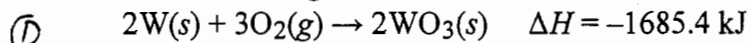
— more on back —

Key

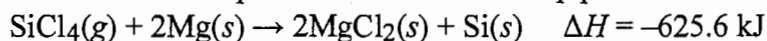
4) Use Hess's Law to calculate the enthalpy change for the reaction



from the following data:



5) Sand is converted to pure silicon in a three step process. The third step is



What is the enthalpy change when 25.0 mol of silicon tetrachloride is converted to elemental silicon

<del>25.0 mol <math>\text{SiCl}_4</math></del>		<del>-1 mol Si</del>		<del>-625.6 kJ</del>	=	<u><math>-1.56 \times 10^4 \text{ kJ}</math></u>
		1 mol $\text{SiCl}_4$		mol Si		<u>-15640 kJ</u>