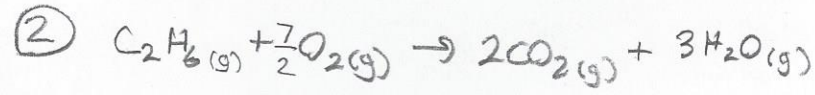
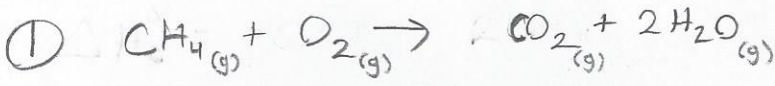


④ 85% methane basis: 1 mole total
10% ethane
5% nitrogen

a)



$$\Delta H_{c,1}^\circ = [(-393,509 \text{ J/mol}) + 2(-241,818 \text{ J/mol})] - [-74,520 \text{ J/mol}]$$

$$\Delta H_{c,1}^\circ = -802625 \text{ J/mol}$$

$$\Delta H_{c,2}^\circ = [2(-393,509 \text{ J/mol}) + 3(-241,818 \text{ J/mol})] - [-83820 \text{ J/mol}]$$

$$\Delta H_{c,2}^\circ = -1428652$$

$$\Delta H_{c,\text{total}}^\circ = -802625 \text{ J/mol} - 1428652 \text{ J/mol}$$

$$= -2231277 \text{ J/mol}$$

$$\Delta H_{c,\text{total}}^\circ = -2231.3 \text{ kJ/mol}$$

b)

