102) $\Delta H° = 1(-395.5) - 1(-427.4) = +33.9 \, KJ$

$q_{H_2O} = 15000_g \times \dfrac{4.184 \, J}{1g \cdot 1°C} \times -60.°C = -3,765,600 \, J$

$q_{sub} = -q_{H_2O}$ $3765.6 \, KJ \times \dfrac{1 mol \, CO_2}{33.9 KJ} \times \dfrac{44.01_g \, CO_2}{1 mol} = 4900_g \, dry \, ice$

105) $C_{16}H_{32}O_2 + 23 O_2 \longrightarrow 16 CO_2 + 16 H_2O$
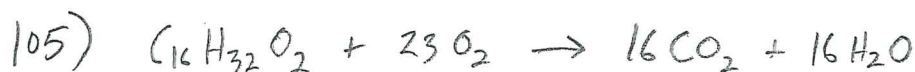
$\Delta H°_{rxn} = \left[16(-393.5) + 16(-285.8)\right] - \left[1(-268) + (0)\right] = -10,661 \, KJ/mol$

$\dfrac{-10,661 \, KJ}{mol} \times \dfrac{1 \, Cal}{4,184 \, KJ} \times \dfrac{1 mol}{256.42} = -9.9378 \, Cal/g$

$C_{12}H_{22}O_{11} + 12 O_2 \longrightarrow 12 CO_2 + 11 H_2O$

$\Delta H°_{rxn} = \left[12(-393.5) + 11(-285.8)\right] - \left[1(-2226.1) + (0)\right] = -5639.7 \, KJ/mol$

$\dfrac{-5639.7 \, KJ}{mol} \times \dfrac{1 \, Cal}{4.184 \, KJ} \times \dfrac{1 mol}{342.30_g} = -3.9378 \, Cal/g$

109.) $q_{cal} = 120.0 \, KJ/°C \times 3.2°C = 384 \, KJ$

$q_{rxn} = -q_{cal}$ $-384 KJ \times \dfrac{1 \, Cal}{4.184 \, KJ} = -91.778 \, Cal \div 16_g = 5.7 \, Cal/g$