Quiz 6.5 – Enthalpies of Formation

Name: _____

Question 1 (2 points)

Write the formation reaction (which is the basis for the enthalpy of formation) for each compound

- $Fe(NO_3)_2$ $Fe_{(s)} + N_{2(g)} + 3O_{2(g)} \rightarrow Fe(NO_3)_2$
- $C_4H_{10}O$ $4\,C_{(s,\,graphite)} + 5\,H_{2(g)} + \frac{1}{2}\,O_{2(g)} \rightarrow C_4H_{10}O$

Question 2 (3 points)

Give the molar enthalpy of reaction for the following reaction:

$$Fe_2O_3(s) + 3\,CO(g) \longrightarrow 2\,Fe(s) + 3\,CO_2(g)$$

You will need the following values:

Compound	ΔH_f°	Compound	ΔH_f°
$Fe_2O_3(s)$	$-824.2\ \frac{kJ}{mol}$	$CO(g)$	$-110.5\ \frac{kJ}{mol}$
$Fe(s)$	$0\ \frac{kJ}{mol}$	$CO_2(g)$	$-393.5\ \frac{kJ}{mol}$

$$\Delta H_{rxn} = \sum_{\text{products}} \nu \cdot \Delta H_f - \sum_{\text{reactants}} \nu \cdot \Delta H_f$$

$$\Delta H_{rxn} = 2 \cdot \emptyset + 3 \cdot (-393.5\ kJ/mol) - (-824.2\ kJ/mol) - 3 \cdot (-110.5\ kJ/mol)$$

$$\Delta H_{rxn} = -24.8\ kJ/mol$$