

Test 1 – Form A

1. A compound has an empirical formula of $C_2H_3NO_2$.

a. Calculate the mass % of nitrogen in this compound to the nearest 0.01%.

mass % nitrogen = _____ (5 pts)

b. If the molecular weight of this compound is 219.12 g/mol, what is the chemical formula for it?

Chemical Formula = _____ (5 pts)

2. Given the following thermodynamic data:



Calculated ΔH° for the following reaction: Show the logic of how reactions were added!



$\Delta H^\circ =$ _____ kJ (5 pts)

3. Calculate the colligative molarity of a 500.0 mL solution prepared with 1.3768 g calcium chloride, $CaCl_2(s)$.

$M_c =$ _____ M (5 pts)

7. What is $[\text{OH}^-]$ in a solution prepared by mixing the following solutions:

500. mL of 1.2 M NaOH

810. mL of 2.0 M LiOH

250. mL of 1.5 M KOH

400. mL of water

$[\text{OH}^-] =$ _____ M (5 pts)

8. a. Complete the following reaction table in mmol for 25.00 mL of 0.135 M HCl reacting with 25.68 grams of iodine, $\text{I}_2(\text{s})$. (10 pts)

	$2\text{HCl}(\text{aq})$	+	$\text{I}_2(\text{s})$	\rightarrow	$2\text{HI}(\text{aq})$	+	$\text{Cl}_2(\text{g})$
initial							
Δ							
final							

b. What is the theoretical yield of $\text{Cl}_2(\text{g})$ in grams? (4 pts)

theoretical yield = _____ grams (3 pts)

c. What concentration of $\text{HI}_{(\text{aq})}$ is formed?

$[\text{HI}] =$ _____ M (3 pts)