

Problem 1

(a) towards ~~reactants~~ products

(b) towards reactants

(c) towards products

(d) towards reactant

problem 2

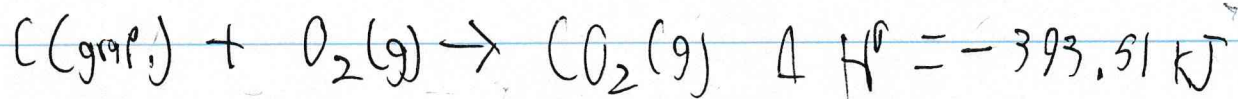
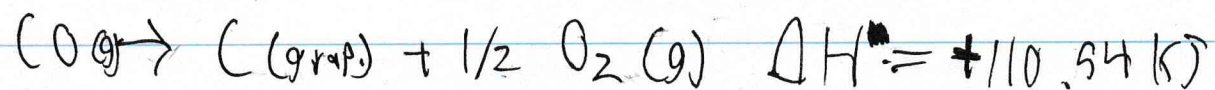
(a) positive

(b) positive

(c) positive

Problem 3

Q: Sum the reactions



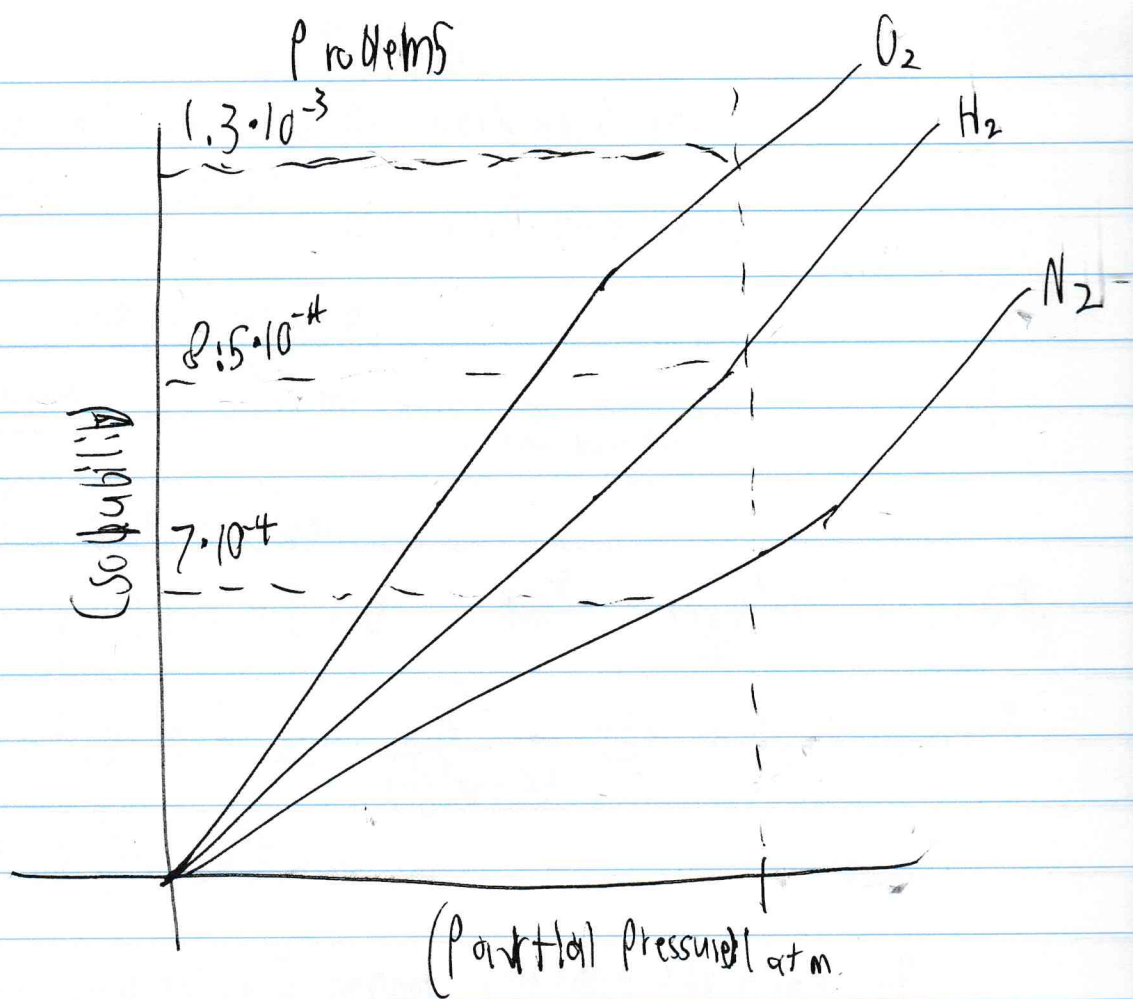
to get

$$\Delta H^\circ = -282.97$$

(b) Stable due to positive ΔG

Problem 4

Molecule 3 due to CO and NH bonds.



Problems

(a): Our 50 ml of 0.1 M weak acid has
 $\frac{0.1 \text{ moles}}{1 \text{ L}} \cdot 50 \text{ ml} = 0.5 \text{ moles acid}$

and the base eliminates

$\frac{0.1 \text{ moles}}{1 \text{ L}} \cdot 20 \text{ ml} = 0.2 \text{ moles}$

Thus, for the reaction



$$K_a = 1.8 \cdot 10^{-5} = \frac{x^2}{\left(\frac{0.3}{0.07} - x\right)} \Rightarrow x \approx 8.78 \cdot 10^{-3}$$

and thus $\text{pH} = 2.056$

(b): By anamed equation I cannot remember the name of,
 $\text{pH} = 4.74$

(c): 90 mL

(d):

$$K_b = \frac{1 \cdot 10^{-14}}{1.8 \cdot 10^{-5}} = \frac{x^2}{(0.105 - x)} \Rightarrow x = 5.27 \cdot 10^{-6}$$

$$\Rightarrow \text{pH} = 8.72$$

Problem 7

Exercise 3