Assignment 2

The due date for submitting the assignment has passed. You get one-try credit to resubmit the assignment.

When \( \text{NaNO}_3 \) is heated, it decomposes as per the following reaction:

\[ 2\text{NaNO}_3 \rightarrow 2\text{Na}_2\text{O} + 5\text{NO}_2 \]

Calculate the following:

1. \( \text{mol of Na}_2\text{O} \) can be produced from 4.8 mol of \( \text{NaNO}_3 \).

2. \( \text{mol of NO}_2 \) can be produced from 4.2 mol of \( \text{NaNO}_3 \).

**Check your answers:**

- No, the answer is incorrect.
- Correct:
- Accepted Answer:
- [Year] Range: [0.0, 1.0]

3. \( \text{mol of Na}_2\text{O} \) were used if 27.3 L of \( \text{NO}_2 \) were produced.

4. 0.84 x 10^3 Pa of \( \text{CaCl}_2 \) solution was titrated with 10.2 mL of 0.005 M \( \text{HNO}_3 \). The molarity of the \( \text{Ca(NO)}_3 \) solution will be _______ M. Report up to two decimal places.

**Check your answers:**

- No, the answer is incorrect.
- Correct:
- Accepted Answer:
- [Year] Range: [0.0, 1.0]

The following liquid phase reaction is taking place inside a CSTR in the presence of \( \text{NaOH} \) (as a catalyst):

\[ \text{C}_2\text{H}_4 + \text{O}_2 \rightarrow \text{C}_2\text{H}_5\text{OH} + \text{H}_2\text{O} \]

The initial concentration of ethylene oxide and water are 1.0 mol/L and 3.47 mol/L, respectively. If the conversion of ethylene oxide is 50%, then find out the following:

- 1.) The fraction conversion of ethylene oxide _______.

2.) The fraction conversion of water _______.

- (5.0 x 10^-3) Pa of \( \text{CH}_3\text{OH} \), solution was titrated with 10.2 mL of 0.005 M \( \text{NaOH} \). The molarity of the \( \text{NaOH} \) solution will be _______ M. Report up to two decimal places.

**Check your answers:**

- No, the answer is incorrect.
- Correct:
- Accepted Answer:
- [Year] Range: [0.0, 1.0]

**Based on the above statement, answer question 2.66:**

Taking \( \text{H}_2 \) as your basis of calculation for the following gas phase reaction, it is to be carried out adiabatically:

\[ \text{H}_2 + \text{F}_2 \rightarrow \text{HF} \]

The molar flow in \( 50\% \) \( \text{H}_2 \) and \( 50\% \) \( \text{F}_2 \) at pressure 0.2 atm and 327 °C. Temperature, if the conversion of \( \text{H}_2 \) is 90%, then:

1. The fractional conversion of \( \text{H}_2 \) will be ________.

2. The fractional conversion of \( \text{F}_2 \) will be ________.

**Check your answers:**

- No, the answer is incorrect.
- Correct:
- Accepted Answer:
- [Year] Range: [0.0, 1.0]