

Question 14

A side reaction in the manufacture of rayon from wood pulp is



How many grams of Na_2CS_3 are produced in the reaction between 92.5 mL of liquid CS_2 and 2.78 mol NaOH?

(Given *density of CS_2 = 1.26 g/mL*)

$$\text{Density} = \frac{\text{Mass solution, g}}{\text{Volume solution, mL}}$$

$$\text{Mass of } \text{CS}_2 = \text{Density} \times \text{Vol solution}$$

$$= \text{_____ g}$$

$$\text{Mol of } \text{CS}_2 = \frac{\text{_____ g}}{\text{g/mole}}$$

$$= \text{_____ mole}$$

Ar of Na = 23

Ar of O = 16

Ar of H = 1

Ar of C = 12

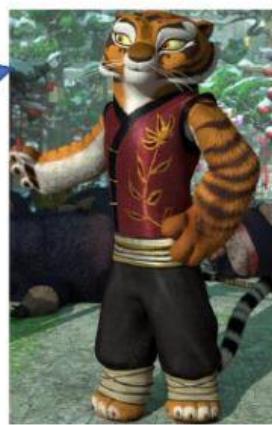
Ar of S = 32

$$\text{Mol of NaOH} = 2.78 \text{mole}$$

Mole of product formed
based on LR!!

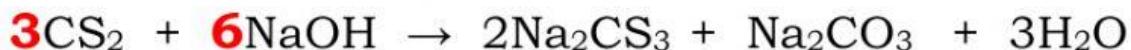
There are **3 methods** to determine the LR:

- 1) Compare mole ratios of the reactants
- 2) Compare the amount of products based on different reactants
- 3) Compare the mole needed vs mole required



Lets say we use **mole ratio of the reactants** to determine the LR

Compare the mole ratio of the reactants



Mole ratio of CS_2 = $\frac{\text{mol of } \text{CS}_2}{\text{S. Coefficient } \text{CS}_2}$ = _____ =

Mole ratio of NaOH = $\frac{\text{mol of } \text{NaOH}}{\text{S. Coefficient } \text{NaOH}}$ = _____ =

Mole ratio of CS_2 _____ mole ratio of NaOH

Limiting reactant is _____

From balanced equation

6 moles of NaOH produces 2 moles Na_2CS_3

6 moles NaOH = 2 moles Na_2CS_3

_____ mol NaOH = _____ x _____ mol Na_2CS_3

= _____ moles Na_2CS_3

Mole Na_2CS_3 = $\frac{\text{mass } \text{Na}_2\text{CS}_3}{\text{molecular mass } \text{Na}_2\text{CS}_3}$

mass Na_2CS_3 = _____ g