ER LR

$2\,Al(s) + 3\,Ca(NO_2)_2(aq) \rightarrow 3\,Ca(s) + 2\,Al(NO_2)_3$

GIVEN 1

2.35g of aluminum reacts with 6.42g of calcium nitrite. GIVEN 2

✓(1) Balance the equation.

✓(2) what is the theoretical yield of aluminum nitrite? ?

✓(3) what is the limiting and excess reactant?

✓(4) If 4.97g of aluminum nitrite are actually produced in lab, what is the % yield?

(5) What mass of excess reactant is left over after the reaction is complete?

For #5

- To solve for the mass of excess reactant left after the reaction is complete, you need to 1ST calculate the amount of excess reactant that reacted with the limiting reactant.

- Solve a stoichiometry problem.
  Given - original mass of the limiting reactant from the question
  Unknown - mass of excess reactant.

- Once you know the mass of excess reactant that was used when it reacted with the limiting reactant, subtract it from the original amount of the excess reactant from the question. The answer will be the mass of excess reactant that is left.

GIVEN 1

$$2.35\text{ g Al} \times \frac{1\text{ mol Al}}{26.98\text{ g Al}} \times \frac{2\text{ mol } Al(NO_2)_3}{2\text{ mol Al}} \times \frac{165.01\text{ g } Al(NO_2)_3}{1\text{ mol } Al(NO_2)_3} = 14.4\text{ g } Al(NO_2)_3$$

GIVEN 2

$$6.42\text{ g } Ca(NO_2)_2 \times \frac{1\text{ mol } Ca(NO_2)_2}{132.10\text{ g } Ca(NO_2)_2} \times \frac{2\text{ mol } Al(NO_2)_3}{3\text{ mol } Ca(NO_2)_2} \times \frac{165.01\text{ g } Al(NO_2)_3}{1\text{ mol } Al(NO_2)_3} = 5.35\text{ g } Al(NO_2)_3$$

theoretical yield (always the smallest answer)

#3 LR - $Ca(NO_2)_2$ why? It gave the smallest answer.

ER - Al

#4 $\%\text{yield} = \frac{\text{actual yield}}{\text{theoretical yield}} \times 100$ ← comes from the ? or lab

$$= \frac{4.97\text{ g}}{5.35\text{ g}} \times 100 = 92.9\%$$

#5

$$6.42\text{ g } Ca(NO_2)_2 \times \frac{1\text{ mol } Ca(NO_2)_2}{132.10\text{ g } Ca(NO_2)_2} \times \frac{2\text{ mol Al}}{3\text{ mol } Ca(NO_2)_2} \times \frac{26.98\text{ g Al}}{1\text{ mol Al}} = .874\text{ g Al reacted w/ } Ca(NO_2)_2$$

started w/ 2.35 g Al
reacted − .874 g Al

left over 1.48 g Al