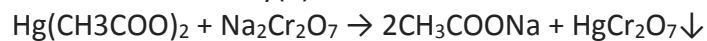


Answer on Question #72407 - Chemistry - General Chemistry

If a solution containing 36.533 g of mercury(II) acetate is allowed to react completely with a solution containing 10.872 g of sodium dichromate, how many grams of solid precipitate will be formed?

Solution:

Reaction of mercury(II) acetate with sodium dichromate:



First, we calculate the number of moles of each reagent:

$$n(\text{Hg}(\text{CH}_3\text{COO})_2) = m(\text{Hg}(\text{CH}_3\text{COO})_2) / M(\text{Hg}(\text{CH}_3\text{COO})_2) = 36,533 / 319 = 0,114 \text{ mol}$$

$$n(\text{Na}_2\text{Cr}_2\text{O}_7) = m(\text{Na}_2\text{Cr}_2\text{O}_7) / M(\text{Na}_2\text{Cr}_2\text{O}_7) = 10,872 / 262 = 0,0414 \text{ mol}$$

We see that in our reaction $\text{Hg}(\text{CH}_3\text{COO})_2$ is an excess reagent, and $\text{Na}_2\text{Cr}_2\text{O}_7$ is a limiting reagent. The precipitate in our reaction is mercury dichromate, now we determine its mass through sodium dichromate.

$M(\text{HgCr}_2\text{O}_7) = 417 \text{ g/mol}$, means

$$m(\text{HgCr}_2\text{O}_7) = m(\text{Na}_2\text{Cr}_2\text{O}_7) \times M(\text{HgCr}_2\text{O}_7) / M(\text{Na}_2\text{Cr}_2\text{O}_7) = 10,872 \times 417 / 262 = 17,3 \text{ g}$$

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