Answer on Question #40494 - Chemistry - Other

Question:

When calcium carbonate is added to hydrochloric acid, calcium chloride, carbon dioxide, and water are produced.

$CaCO_3(s) + 2HCl(aq) ---> CaCl_2(aq) + H_2O(l) + CO_2(g)$

1)How many grams of calcium chloride will be produced when 29.0 g of calcium carbonate are combined with 14.0 g of hydrochloric acid?

2)Which reactant is in excess and how many grams of this reactant will remain after the reaction is complete?

Solution:

We need to know amount of each reactant:

$n(CaCO_3) = 29.0 / 100.1 = 0.29$ mol

$n(HCl) = 14.0 / 36.5 = 0.38$ mol

Calcium carbonate is in excess

$m(CaCl_2) = 111.1 * 0.38 / 2 = 21.1$ g

After the reaction is complete calcium carbonate will remain

$m(CaCO_3) = (0.29 – 0.38 / 2) * 100.1 = 10.0$ g

Answer:

1) 21.1

2) 10.0 grams of calcium carbonate