Answer on Question #61045, Chemistry / General Chemistry

Question

5 g of zinc is added to hydrochloric acid to produce 2.04g of zinc chloride salt. find the mass of zinc powder that does not react with the acid

Answer

Chemical equation: $Zn + 2HCl \rightarrow ZnCl_2 + H_2$

$$m_{total}(Zn) = m_{react}(Zn) + m_{dontreact}(Zn)$$

$$m_{react}(Zn) = M(Zn) \cdot \vartheta(Zn) = M(Zn) \cdot \vartheta(ZnCl_2) = M(Zn) \cdot \frac{m(ZnCl_2)}{M(ZnCl_2)} = 65 \cdot \frac{2.04}{136} = 0.975 \text{ (g)}$$

$$m_{dontreact}(Zn) = m_{total}(Zn) - m_{react}(Zn) = 5 - 0.975 = 4.025 \text{ (g)}$$

So, the mass of zinc powder that does not react with the acid is **4.025g**.