



Vaja

Koliko gramov plinastega kisika nastane pri segrevanju 200 gramov živosrebrovega(II) oksida?

$$\frac{m(\text{Hg}_2\text{O}) = 200\text{g}}$$

$$m(\text{O}_2) =$$



$$\frac{m(\text{Hg}_2\text{O})}{m(\text{O}_2)} \rightarrow \frac{2}{1}$$

$$2 \cdot m(\text{Hg}_2\text{O}) = m(\text{O}_2)$$

$$2 \cdot \frac{m(\text{Hg}_2\text{O})}{M(\text{Hg}_2\text{O})} = \frac{m(\text{O}_2)}{M(\text{O}_2)}$$

$$m(\text{O}_2) = \frac{2 \cdot m(\text{Hg}_2\text{O}) \cdot M(\text{O}_2)}{M(\text{Hg}_2\text{O})}$$

$$m(\text{O}_2) = \frac{2 \cdot 200\text{g} \cdot 32 \frac{\text{g}}{\text{mol}}}{216,6 \frac{\text{g}}{\text{mol}}}$$

$$m(\text{O}_2) = 59,1\text{g}$$

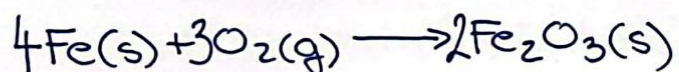
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Vaja

Za koliko se poveča masa 100 gramov čistega železa v prahu, pri popolni oksidaciji do železovega(III) oksida.

$$\begin{aligned} m(\text{Fe}) &= 100\text{g} \\ m(\text{Fe}_2\text{O}_3) &= 143\text{g} \\ \Delta m &= 43\text{g} \end{aligned}$$



$$\frac{m(\text{Fe})}{m(\text{Fe}_2\text{O}_3)} \neq \frac{4}{2}$$

$$\begin{aligned} 4 \cdot m(\text{Fe}_2\text{O}_3) &= 2 \cdot m(\text{Fe}) \\ 4 \cdot \frac{m(\text{Fe}_2\text{O}_3)}{M(\text{Fe}_2\text{O}_3)} &= 2 \cdot \frac{m(\text{Fe})}{M(\text{Fe})} \end{aligned}$$

$$m(\text{Fe}_2\text{O}_3) = \frac{2 \cdot m(\text{Fe}) \cdot M(\text{Fe}_2\text{O}_3)}{2 \cdot 4 \cdot M(\text{Fe})}$$

$$m(\text{Fe}_2\text{O}_3) = \frac{100\text{g} \cdot 159,7 \frac{\text{g}}{\text{mol}}}{2 \cdot 55,8 \frac{\text{g}}{\text{mol}}}$$

$$m(\text{Fe}_2\text{O}_3) = 143\text{g}$$

$$\Delta m = m(\text{Fe}_2\text{O}_3) - m(\text{Fe})$$

$$\Delta m = 143\text{g} - 100\text{g}$$

$$\Delta m = 43\text{g}$$



Vaja

3 gramov Aluminija, ki vsebuje 10 % nečistoč, damo v klorovodikovo kislino.
Koliko gramov vodika nastane, če zreagira ves aluminij?

$$\underline{m(\text{Al} + \text{nečistoče}) = 3\text{g}}$$

$$m(\text{H}_2) = 0,3\text{g}$$

$$m(\text{nečistoče}) = w \cdot m(\text{Al} + \text{nečistoče})$$

$$m(\text{nečistoče}) = 0,10 \cdot 3\text{g}$$

$$m(\text{nečistoče}) = 0,3\text{g}$$

$$m(\text{Al}) = 3\text{g} - 0,3\text{g}$$

$$m(\text{Al}) = 2,7\text{g}$$



$$\frac{m(\text{Al})}{m(\text{H}_2)} \neq \frac{2}{3}$$

$$2 \cdot m(\text{H}_2) = 3 \cdot m(\text{Al})$$

$$2 \cdot \frac{m(\text{H}_2)}{\pi(\text{H}_2)} = 3 \cdot \frac{m(\text{Al})}{\pi(\text{Al})}$$

$$m(\text{H}_2) = 3 \cdot \frac{m(\text{Al}) \cdot \pi(\text{H}_2)}{2 \cdot \pi(\text{Al})} = \frac{3 \cdot 2,7\text{g} \cdot 2\text{g/mol}}{2 \cdot 27\text{g/mol}} = 0,3\text{g}$$

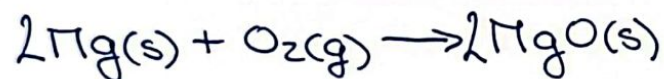
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Vaja

Pri reakciji 12,2 gramov magnezija in 12 gramov kisika nastane magnezijev oksid.
Kateri element in koliko ga še ostane v reakcijski zmesi po končani reakciji?

$$\begin{aligned} m(\text{Mg}) &= 12,2 \text{ g} \\ m(\text{O}_2) &= 12 \text{ g} \end{aligned}$$



$$m(\text{Mg}) = 2 \cdot m(\text{O}_2) = 0,76 \text{ mol}$$

$$\frac{m(\text{Mg})}{m(\text{O}_2)} = \frac{2}{1} \Rightarrow \frac{n(\text{Mg})}{2} = \frac{n(\text{O}_2)}{1} \Rightarrow m(\text{O}_2) = \frac{m(\text{Mg})}{2} = 0,255 \text{ mol}$$

kisik v prebitku

$$n(\text{Mg}) = \frac{m(\text{Mg})}{M(\text{Mg})} \quad n(\text{O}_2) = \frac{m(\text{O}_2)}{M(\text{O}_2)}$$

$$n(\text{Mg}) = \frac{12,2 \text{ g}}{24,3 \text{ g/mol}} \quad n(\text{O}_2) = \frac{12 \text{ g}}{32 \text{ g/mol}}$$

$$n(\text{Mg}) = 0,51 \text{ mol} \quad n(\text{O}_2) = 0,38 \text{ mol}$$

$$n_{\text{porabljenega O}_2} = 0,255 \text{ mol}$$

$$n_{\text{prebitnega O}_2} = 0,38 \text{ mol} - 0,255 \text{ mol}$$

$$n(\text{prebitnega O}_2) = 0,125 \text{ mol}$$

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$$\begin{aligned} m_{\text{prebitnega O}_2} &= 0,125 \text{ mol} \cdot 32 \frac{\text{g}}{\text{mol}} \\ &= \underline{\underline{4 \text{ g}}} \end{aligned}$$



Vaja

100 gramov Silicijevega(IV) oksida in 100 gramov ogljika zreagira po enačbi:



Kateri reaktant ostane nezreagiran in koliko gramov ga ostane?
Koliko gramov SiC nastane?

$n_{\text{ostanka C}} = 8,3 \text{ mol} - 5,1 \text{ mol}$
 $= 3,2 \text{ mol}$
 $m_{\text{ostanka C}} = 38,4 \text{ g}$

$m(\text{SiO}_2) = 100 \text{ g}$
 $m(\text{C}) = 100 \text{ g}$

 $m(\text{SiC}) = 68 \text{ g}$

$\frac{n(\text{SiO}_2)}{n(\text{C})} \neq \frac{1}{3}$

$3 \cdot n(\text{SiO}_2) = n(\text{C})$ Ogljik v presežku

$\frac{n(\text{SiO}_2)}{1} = \frac{n(\text{C})}{3}$

$n(\text{C}) = 3 \cdot 1,7 \text{ mol} = 5,1 \text{ mol}$

$n(\text{SiO}_2) = \frac{8,3 \text{ mol}}{3} = 2,75 \text{ mol}$

$n(\text{SiO}_2) = \frac{m(\text{SiO}_2)}{M(\text{SiO}_2)}$

$n(\text{SiO}_2) = \frac{100 \text{ g}}{60,1 \text{ g/mol}}$

$n(\text{SiO}_2) = 1,7 \text{ mol}$

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$\frac{n(\text{SiO}_2)}{n(\text{SiC})} = \frac{1}{1}$

$n(\text{SiC}) = n(\text{SiO}_2)$

$m(\text{SiC}) = \frac{n(\text{SiO}_2) \cdot M(\text{SiC})}{M(\text{SiO}_2)} = 68 \text{ g}$

$n(\text{C}) = \frac{m(\text{C})}{M(\text{C})}$

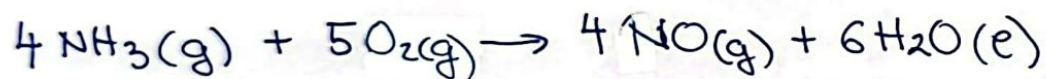
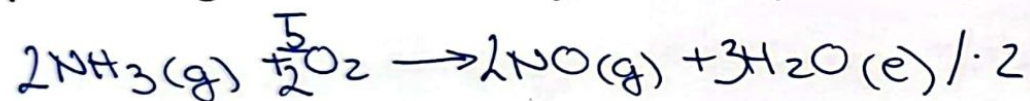
$n(\text{C}) = \frac{100 \text{ g}}{12 \text{ g/mol}}$

$n(\text{C}) = 8,3 \text{ mol}$



Vaja

7 gramov amonijaka zgori s 25 grami kisika v NO in H₂O. Izračunajte masni delež prebitnega kisika v reakcijski zmesi po reakciji.



$$\frac{n(\text{NH}_3)}{n(\text{O}_2)} \neq \frac{4}{5}$$

$$4 \cdot n(\text{O}_2) = 5 \cdot n(\text{NH}_3)$$

$$n(\text{O}_2) = \frac{5 \cdot n(\text{NH}_3)}{4} = 0,51 \text{ mol}$$

Toliko se ga
↑ ponabi

$$n(\text{O}_2)_{\text{prebitnega}} = 0,78 \text{ mol} - 0,51 \text{ mol} = 0,27 \text{ mol}$$

$$m(\text{O}_2)_{\text{preb.}} = 8,64 \text{ g}$$

$$n(\text{O}_2) = \frac{m(\text{O}_2)}{M(\text{O}_2)} = 0,78 \text{ mol}$$

$$n(\text{NH}_3) = \frac{m(\text{NH}_3)}{M(\text{NH}_3)} = 0,41 \text{ mol}$$

$$\frac{n(\text{NH}_3)}{n(\text{NO})} = \frac{4}{4} \Rightarrow n(\text{NH}_3) = n(\text{NO})$$

$$\frac{m(\text{NH}_3)}{M(\text{NH}_3)} = \frac{m(\text{NO})}{M(\text{NO})}$$

$$m(\text{zmesi}) = m(\text{O}_2) + m(\text{NH}_3) + m(\text{NO}) = 8,64 \text{ g} + 11,1 \text{ g} + 12,3 \text{ g} = 32,04 \text{ g}$$

$$n(\text{O}_2) = \frac{8,64 \text{ g}}{32,04 \text{ g}} = \underline{\underline{0,27}}$$

$$\frac{n(\text{NH}_3)}{n(\text{H}_2\text{O})} \neq \frac{2}{3}$$

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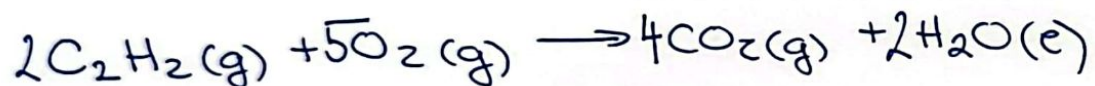
$$m(\text{NO}) = \frac{m(\text{NH}_3) \cdot M(\text{NO})}{M(\text{NH}_3)} = \frac{7 \text{ g} \cdot 30 \frac{\text{g}}{\text{mol}}}{17 \frac{\text{g}}{\text{mol}}} = 12,3 \text{ g}$$

$$2 \cdot n(\text{H}_2\text{O}) = 3 \cdot n(\text{NH}_3) \Rightarrow \frac{2 \cdot m(\text{H}_2\text{O})}{M(\text{H}_2\text{O})} = \frac{3 \cdot m(\text{NH}_3)}{M(\text{NH}_3)} \quad m(\text{H}_2\text{O}) = \frac{3 \cdot 7 \text{ g} \cdot 18 \frac{\text{g}}{\text{mol}}}{2 \cdot 17 \frac{\text{g}}{\text{mol}}} = 11,1 \text{ g}$$

Vaja



Etin zgoreva v ogljikov dioksid in vodo. Ali je 390 gramov kisika dovolj za popolno zgorevanje 80 gramov etina?



$$m(\text{O}_2) = 390\text{g}$$

$$m(\text{et}) = 80\text{g}$$

$$\frac{n(\text{C}_2\text{H}_2)}{n(\text{O}_2)} \neq \frac{2}{5}$$

$$2 \cdot n(\text{O}_2) = 5 \cdot n(\text{C}_2\text{H}_2)$$

$$n(\text{C}_2\text{H}_2) = \frac{m(\text{C}_2\text{H}_2)}{M(\text{C}_2\text{H}_2)}$$

$$n(\text{O}_2) = \frac{5 \cdot m(\text{C}_2\text{H}_2)}{2} = 7,75\text{ mol}$$

$$n(\text{C}_2\text{H}_2) = 3,1\text{ mol}$$

$$n(\text{O}_2) = \frac{m(\text{O}_2)}{M(\text{O}_2)}$$

$$n(\text{O}_2) = 12,18\text{ mol} \rightarrow \text{Množina kisika pri reakciji}$$

↓ množina kisika, ki se porabi pri gorenju 80g etina

Kisika je dovolj

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