Uztaila - 2006

(A2) (a) Oxidazio-egoerak:

$$\overset{0}{Cu}(s) + \overset{+1\,+5\,-2}{HNO_3}(aq) \rightarrow \overset{+2\;\;+5\;-2}{Cu(NO_3)_2}(aq) + \overset{+2\;-2}{NO}(g) + \overset{+1\;-2}{H_2O}(l)$$

oxidatua ... Cu ... $Cu \rightarrow Cu^{2+}$

erreduzitua: N ... $NO_3^- \rightarrow NO$

(b) Ekuazio doitua

$$3\times (Cu \rightarrow Cu^{2+} + 2e^-)$$

$$2\times (NO_3^- + 4H^+ + 3e^- \rightarrow NO + 2H_2O)$$

$$3\,Cu + 2\,NO_3^- + 8\,H^+ \rightarrow 3\,Cu^{2+} + 2\,NO + 4\,H_2O$$

$$\boxed{3\,Cu + 8\,HNO_3 \rightarrow 3\,Cu(NO_3)_2 + 2\,NO + 4\,H_2O}$$

Erreaktibo mugatzailearen determinazioa

$$n(HNO_3) = 3\,\frac{mol}{L} \times 0.1\,L = 0.3\,mol\,HNO_3$$

10 g Cu behar duen HNO_3:

$$n(HNO_3) = 10\,g\,Cu \times \frac{1\,mol\,Cu}{63.5\,g\,Cu} \times \frac{8\,mol\,HNO_3}{3\,mol\,Cu} = 0.42\,mol\,HNO_3 \text{ behar du}$$

HNO_3 mugatzailea

Sortzen den $Cu(NO_3)_2$ masa, gehienez:

$$m(Cu(NO_3)_2) = 0.3\,mol\,HNO_3 \times \frac{3\,mol\,Cu(NO_3)_2}{8\,mol\,HNO_3} \times \frac{187.5\,g}{1\,mol\,Cu(NO_3)_2}$$

$$Mm(Cu(NO_3)_2) = (1\times 63.5) + (2\times 14) + (6\times 16) = 187,5\,g/mol$$

$$\boxed{m = 21.1\,g\,Cu(NO_3)_2}$$