[m] $CO_2 + 2NaOH \rightarrow Na_2CO_3 + H_2O$

$NaOH = 23+16+1 = 40\,g$

$120\,g\,NaOH \times \frac{1\,mol\,NaOH}{40\,g} \times \frac{1\,mol\,CO_2}{2\,mol\,NaOH} =$

$= 1,5\,mol\,CO_2$

$V = \frac{nRT}{P} = \frac{1,5 \cdot 0,082 \cdot 273}{1} = 33,579\,L$

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[u] $Zn + 2HCl \rightarrow ZnCl_2 + H_2$

$6\,g\,HCl \times \frac{1\,mol\,HCl}{36,5\,g} \times \frac{1\,mol\,Zn}{2\,mol\,HCl} \times \frac{65,4\,g}{1\,mol\,Zn} =$

$= 5,375\,g$

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[r] IDEM vol H_2 cn

$6\,g\,HCl \times \frac{1\,mol\,HCl}{36,5\,g} \times \frac{1\,mol\,H_2}{2\,mol\,HCl} = 0,082\,moles$

$V = \frac{nRT}{P} = \frac{0,082 \cdot 0,082 \cdot 273}{1} = 1836\,L$

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[c] $2HCl + MgO \rightarrow MgCl_2 + H_2O$

$7,5\,g\,HCl \times \frac{1\,mol\,HCl}{36,5\,g} \times \frac{1\,mol\,MgCl_2}{2\,mol\,HCl} \times \frac{125,7\,g}{1\,mol\,MgCl_2} =$

$= 12,935\,g$

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[i] IDEM V

$7,5\,g\,HCl \times \frac{1\,mol\,HCl}{36,5\,g} \times \frac{1\,mol\,H_2O}{2\,mol\,HCl} = 0,103\,mol$

$V = \frac{nRT}{P} = \frac{0,103 \cdot 0,082 \cdot 273}{1} = 2,30\,L$

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[e] $Pb(NO_3)_2 + KI \rightarrow PbI_2 + 2KNO_3$

$Pb(NO_3)_2 + 2KI \rightarrow PbI_2 + 2KNO_3$

$Pb(NO_3)_2 = 331,2\,g$ $PbI_2 = 461\,g$

$15\,g\,Pb(NO_3)_2 \times \frac{1\,mol\,Pb(NO_3)_2}{331,2\,g} \times \frac{1\,mol\,PbI_2}{1\,mol\,Pb(NO_3)_2} \times$

$\times \frac{461\,g}{1\,mol\,PbI_2} = 20,879\,g$

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[a]

$Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$

$10,5\,g\,Zn \times \frac{1\,mol\,Zn}{65,4\,g} \times \frac{1\,mol\,ZnSO_4}{1\,mol\,Zn} \times \frac{161,4\,g}{1\,mol\,ZnSO_4} =$

$= 25,44\,g$

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[a]

$C_5H_{12} + 8\,O_2 \rightarrow 5\,CO_2 + 6\,H_2O$

$25°C = 298\,K \quad P = 700\,mmHg = 0,921\,atm$

$216\,g\,C_5H_{12} \times \frac{1\,mol\,C_5H_{12}}{72\,g} \times \frac{8\,mol\,O_2}{1\,mol\,C_5H_{12}} = 24\,mol$

$V = \frac{nRT}{P} = \frac{24 \cdot 0,082 \cdot 298}{0,921} = 636,76\,L$

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[s] IDEM

$600\,g\,CO_2 \times \frac{1\,mol\,CO_2}{44\,g} \times \frac{1\,mol\,C_5H_{12}}{5\,mol\,CO_2} \times \frac{72\,g}{1\,mol\,C_5H_{12}} =$

$= 216\,g$

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[o]

$CO_2 + 2NaOH \rightarrow Na_2CO_3 + H_2O$

$100\,g\,NaOH \times \frac{1\,mol\,NaOH}{40\,g} \times \frac{1\,mol\,H_2O}{2\,mol\,NaOH} \times$

$\times \frac{18\,g}{1\,mol\,H_2O} = 22,5\,g\,H_2O$
