

**Azterketa: kalkulu kimikoa eta formulazio organikoa**

Izena:

Kurtsoa:

1 Disoluzio bat prestatzen da 25 g NaOH eta ura 750 mL-ko bolumena osatu arte botata. Kalkulatu:

- kontzentrazioa g/L-tan
- kontzentrazioa mol/L-tan
- zenbateko bolumena hartu behar den disoluzio horretatik 0,2 mol egoteko
- disoluzio horretatik 50 mL hartzen badira, zenbat gramo NaOH egongo diren bertan

PUNTUAZIOA: 2 PUNTU

DATUAK:

NaOH substantziaren masa molarra = 40 g/mol

$$\textcircled{1} \quad a) \text{ Koutz (g/L)} = \frac{25 \text{ g NaOH}}{0,75 \text{ L dis}} = \boxed{33,3 \frac{\text{g NaOH}}{\text{L dis}}}$$

$$b) \text{ Koutz (mol/L)} = \frac{33,3 \frac{\text{g NaOH}}{\text{L}}}{40 \text{ g}} \cdot \frac{1 \text{ mol}}{40 \text{ g}} = \boxed{0,83 \frac{\text{mol NaOH}}{\text{L dis}}}$$

$$c) \quad V = 0,2 \text{ mol NaOH} \cdot \frac{1 \text{ L dis}}{0,83 \text{ mol}} = \boxed{0,241 \text{ L dis} = 241 \text{ mL}}$$

$$d) \quad m = 50 \text{ mL} \cdot \frac{1 \text{ L}}{1000 \text{ mL}} \cdot \frac{33,3 \text{ g NaOH}}{1 \text{ L dis}} = \boxed{1,665 \text{ g NaOH}}$$

2	<p>80 L-ko ontzi batean O<sub>2</sub> gasa daukagu. Ontziaren presioa 4,5 atm-koa da eta temperatura 27 °C. Kalkulatu:</p> <ul style="list-style-type: none"> <li>• zenbat O<sub>2</sub> dagoen ontzi horretan (mol eta gramotan)</li> <li>• temperatura 77 °C-ra igoko balitz eta presioa 1,2 atm-ra jeitsi, gas horrek okupatuko lukeen bolumena</li> </ul> <p>PUNTUAZIOA: 2 PUNTU</p>
<p>DATUAK:</p> <p>R=0,082 <math>\frac{\text{atm}\cdot\text{L}}{\text{K}\cdot\text{mol}}</math></p> <p>Masa atomikoak: O=16</p>	

$$\textcircled{2} \quad a) \quad pV = nRT \rightarrow n = \frac{pV}{RT} = \frac{4,5 \text{ atm} \cdot 80 \text{ L}}{0,082 \frac{\text{atm}\cdot\text{L}}{\text{K}\cdot\text{mol}} \cdot (273+27) \text{ K}} = \boxed{14,63 \text{ mol O}_2}$$

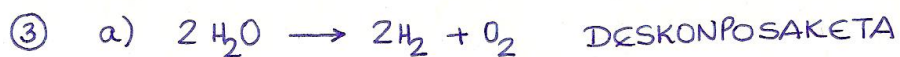
$$M_m(\text{O}_2) = 2 \times 16 = 32 \text{ g/mol}$$

$$m = 14,63 \text{ mol O}_2 \cdot \frac{32 \text{ g O}_2}{1 \text{ mol}} = \boxed{468,16 \text{ g O}_2}$$

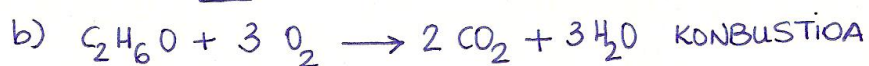
$$b) \quad \frac{p_1 \cdot V_1}{T_1} = \frac{p_2 \cdot V_2}{T_2} \rightarrow \frac{4,5 \text{ atm} \cdot 80 \text{ L}}{(273+27) \text{ K}} = \frac{1,2 \text{ atm} \cdot V_2}{(273+77) \text{ K}} \rightarrow$$

$$\rightarrow V_2 = \frac{4,5 \text{ atm} \cdot 80 \text{ L}}{300 \text{ K}} \cdot \frac{350 \text{ K}}{1,2 \text{ atm}} = \boxed{350 \text{ L gas}}$$

3	Doitu ondoko ekuazio kimikoak eta zein erreakzio-motak diren adierazi. Ekuazioren bat amaitu gabe balego, osatu falta diren substantziak idatziz
PUNTUAZIOA: 1 PUNTU	
$\text{H}_2\text{O} \rightarrow \text{H}_2 + \text{O}_2$ $\text{C}_2\text{H}_6\text{O} + \text{O}_2 \rightarrow$	



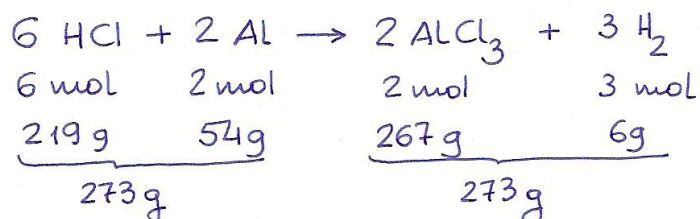
	Has	Buk
H	4	4
O	2	2



	Has	Buk
C	2	2
H	6	6
O	7	7

<p>4 Hona hemen ekuazio kimiko doitua. Kalkulatu</p> <ul style="list-style-type: none"> <li>• zenbat gramo <math>\text{AlCl}_3</math> lortuko diren 7,25 mol <math>\text{HCl}</math> erreakzionatzen dutenean</li> <li>• kalkulatu 7,25 mol horietan zenbat molekula <math>\text{HCl}</math> eta zenbat gramo <math>\text{Cl}</math> egongo diren</li> </ul> <p>Kalkuluak egiteko bihurketa-faktoreen metodoa erabili</p> $6 \text{ HCl} + 2 \text{ Al} \rightarrow 2 \text{ AlCl}_3 + 3 \text{ H}_2$ <p>PUNTUAZIOA: 2 PUNTU</p>
<p>DATUAK Masa atomikoak: <math>\text{Al}=27</math>; <math>\text{H}=1</math>; <math>\text{Cl}=35,5</math></p>

④



$$M_m(\text{HCl}) = 1 + 35,5 = 36,5 \text{ g/mol}$$

$$M_m(\text{AlCl}_3) = 27 + (3 \times 35,5) = 133,5 \text{ g/mol}$$

$$M_m(\text{H}_2) = 2 \times 1 = 2 \text{ g/mol}$$

$$a) \quad x = 7,25 \text{ mol HCl} \frac{267 \text{ g AlCl}_3}{6 \text{ mol HCl}} = \boxed{322,63 \text{ g AlCl}_3}$$

$$b) \quad x = 7,25 \text{ mol HCl} \frac{6,02 \cdot 10^{23} \text{ molekula}}{1 \text{ mol}} = \boxed{4,36 \cdot 10^{24} \text{ molekula HCl}}$$

$$x = 7,25 \text{ mol HCl} \frac{35,5 \text{ g Cl}}{1 \text{ mol HCl}} = \boxed{257,4 \text{ g Cl}}$$

5 Ondoko taula bete	
PUNTUAZIOA: 1 PUNTU	
Azido 2-metilbutanoiko	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3 - \text{CH}_2 - \text{CH} - \text{C} - \text{OH} \\   \\ \text{CH}_3 \end{array}$
2,3-dimetilziklopentanona	$\begin{array}{c} \text{CH}_3 \\ \diagup \\ \text{CH}_3 - \text{CH} - \text{CH} \\   \quad \quad \quad \diagdown \\ \text{CH}_2 \quad \quad \quad \text{C} = \text{O} \\ \quad \quad \quad \diagup \\ \quad \quad \quad \text{CH}_2 \end{array}$
Metilpropano	$\begin{array}{c} \text{CH}_3 - \text{CH} - \text{CH}_3 \\   \\ \text{CH}_3 \end{array}$
Etanol	$\text{CH}_3 - \text{CH}_2\text{OH}$
2-buteno	$\text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_3$