

COLÉGIO NOSSA SENHORA DA SOLEDADE

"A vida está cheia de desafios que, aproveitados de modo criativo, transformam-se em oportunidades".
Max Well.

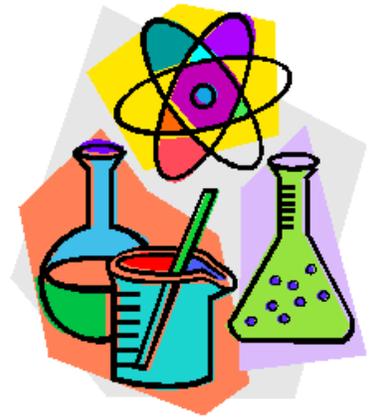


QUÍMICA – 2ª E.M.

PROFESSORA: SANDRA GUIMARÃES

ROTEIRO DA AULA

BOA AULA!



I) Avisem onde estiverem que você não poderá ser incomodado, para não dispersar.

II) Chamadas às 8h15min e 9h15min.

Escreva no CHAT: presente, o seu nome e sobrenome e a turma.

III) A duração da nossa aula será de 1h e 30 minutos. Se a reunião “cair”, entre novamente.

IV) Esteja com a lista impressa ou no computador ou no celular; como achar melhor.

V) Estarei abrindo as listas II e III. Vamos retomar ao conteúdo e tirar dúvidas destas listas .

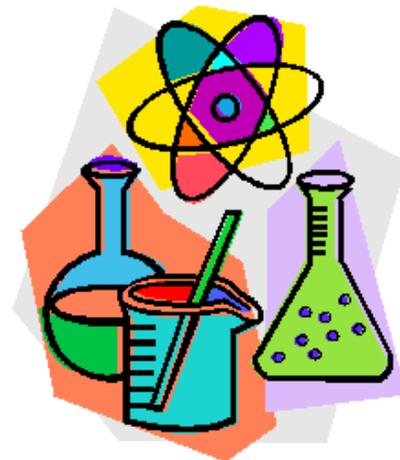
VI) Irei silenciar o microfone de todos. Para qualquer dúvida, levante a mão ou escreva no bate-papo(CHAT).

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RESOLUÇÃO LISTA II

BOA AULA!



- 1 mol – M (g) - $6 \cdot 10^{23}$ (moléculas, átomos...) – 22,4 litros nas CNTP

- Exs.:

(I) 1 mol CO_2 – 44 gramas - $6 \cdot 10^{23}$ moléculas – 22,4 litros CNTP – 1 mol de átomos de C e 2 mol de átomos de Oxigênio.

(II) 1 mol Na - 23 gramas - $6 \cdot 10^{23}$ átomos

- Constante de Avogadro = $6 \cdot 10^{23}$

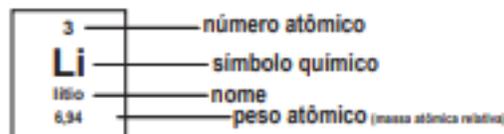
- Resolver as questões **1 e 4**

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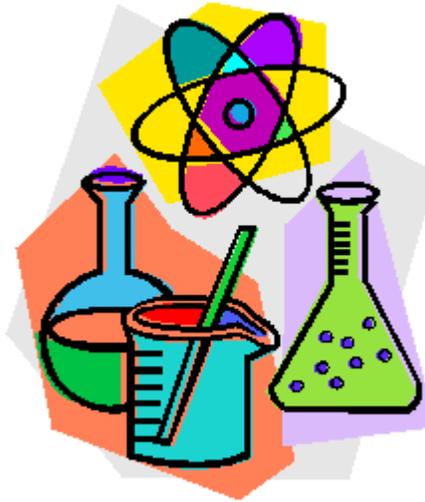
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Tabela periódica

1 H hidrogênio 1,008																	18 He hélio 4,0026
3 Li lítio 6,94	4 Be berílio 9,0122											5 B boro 10,81	6 C carbono 12,011	7 N nitrogênio 14,007	8 O oxigênio 15,999	9 F flúor 18,998	10 Ne neônio 20,180
11 Na sódio 22,990	12 Mg magnésio 24,305											13 Al alumínio 26,982	14 Si silício 28,085	15 P fósforo 30,974	16 S enxofre 32,06	17 Cl cloro 35,45	18 Ar argônio 39,95
19 K potássio 39,098	20 Ca cálcio 40,078(4)	21 Sc escândio 44,956	22 Ti titânio 47,867	23 V vanádio 50,942	24 Cr cromio 51,996	25 Mn manganês 54,938	26 Fe ferro 55,845(2)	27 Co cobalto 58,933	28 Ni níquel 58,693	29 Cu cobre 63,546(3)	30 Zn zinco 65,38(2)	31 Ga gálio 69,723	32 Ge germânio 72,630(8)	33 As arsênio 74,922	34 Se selênio 78,971(8)	35 Br bromo 79,904	36 Kr criptônio 83,798(2)
37 Rb rubídio 85,468	38 Sr estrôncio 87,62	39 Y ítrio 88,906	40 Zr zircônio 91,224(2)	41 Nb nióbio 92,906	42 Mo molibdênio 95,95	43 Tc tecnécio	44 Ru rutênio 101,07(2)	45 Rh ródio 102,91	46 Pd paládio 106,42	47 Ag prata 107,87	48 Cd cádmio 112,41	49 In índio 114,82	50 Sn estanho 118,71	51 Sb antimônio 121,76	52 Te telúrio 127,60(3)	53 I iodo 126,90	54 Xe xenônio 131,29
55 Cs césio 132,91	56 Ba bário 137,33	57 a 71	72 Hf háfnio 178,49(2)	73 Ta tântalo 180,95	74 W tungstênio 183,84	75 Re rênio 186,21	76 Os ósmio 190,23(3)	77 Ir irídio 192,22	78 Pt platina 195,08	79 Au ouro 196,97	80 Hg mercúrio 200,59	81 Tl tálio 204,38	82 Pb chumbo 207,2	83 Bi bismuto 208,98	84 Po polônio	85 At astato	86 Rn radônio
87 Fr frâncio	88 Ra rádio	89 a 103	104 Rf rutherfordório	105 Db dúbnio	106 Sg seabórgio	107 Bh bóhrio	108 Hs hássio	109 Mt meitnério	110 Ds darmstádio	111 Rg roentgênio	112 Cn copernício	113 Nh nihônio	114 Fl fleróvio	115 Mc moscóvio	116 Lv livermório	117 Ts tennesso	118 Og oganessônio
			57 La lantânio 138,91	58 Ce cério 140,12	59 Pr praseodímio 140,91	60 Nd neodímio 144,24	61 Pm promécio	62 Sm samário 150,36(2)	63 Eu europio 151,96	64 Gd gadolínio 157,25(3)	65 Tb térbio 158,93	66 Dy disprósio 162,50	67 Ho hólmio 164,93	68 Er érbio 167,26	69 Tm túlio 168,93	70 Yb itérbio 173,05	71 Lu lutécio 174,97
			89 Ac actínio	90 Th tório 232,04	91 Pa protactínio 231,04	92 U urânio 238,03	93 Np neptunio	94 Pu plutônio	95 Am amerício	96 Cm cúrio	97 Bk berquílio	98 Cf califórnio	99 Es einstênio	100 Fm férmio	101 Md mendelévio	102 No nobélio	103 Lr laurêncio



RESOLUÇÃO LISTA II



3) Dose recomendada $C_6H_8O_6 = 60 \text{ mg/dia}$
em 30 dias = $60 \times 30 = 1800 \text{ mg} = 1,8 \text{ g}$

($1 \text{ g} = 1000 \text{ mg}$)

$$\begin{array}{l} 1 \text{ mol} \text{ --- } 176 \text{ g} \\ x \text{ --- } 1,8 \text{ g} \end{array}$$

$$x \approx 0,01023 \text{ mol}$$

$$x = 10,23 \text{ milimol}$$

$$C_6H_8O_6 = \begin{array}{r} 6 \cdot 12 = 72 \\ 8 \cdot 1 = 8 \\ 6 \cdot 16 = 96 \\ \hline 176 \text{ g} \end{array}$$

$$1 \text{ mol} \text{ --- } 1000 \text{ milimol}$$

$$0,01023 \text{ --- } x$$

$$x = 10,23 \text{ milimol}$$

4) $1 \text{ mol } H_4P_2O_7 \text{ --- } 4 \text{ mols H átomos}$

$0,5 \text{ mol}$

$-\ y$

$$y = 2 \text{ mols H átomos}$$

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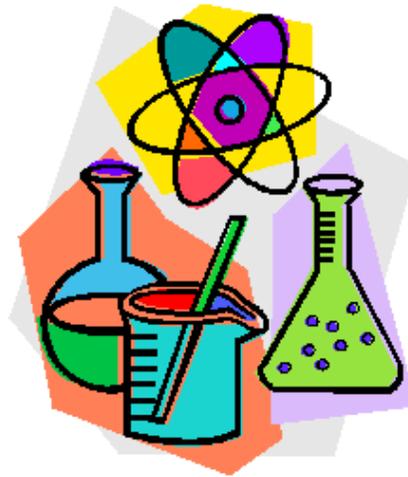
RESOLUÇÃO LISTA II

COMO CALCULAR A MASSA ATÔMICA DO ELEMENTO?

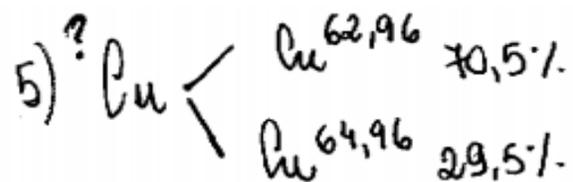
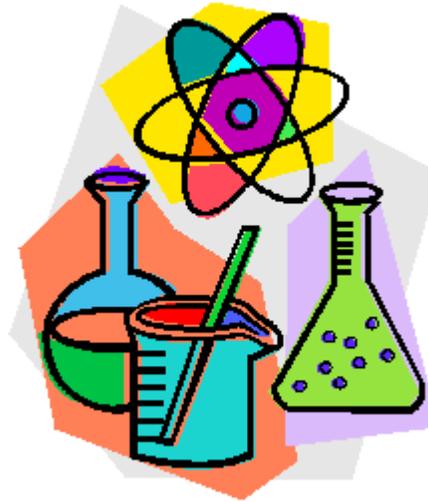
Usando a média aritmética ponderada:

$$M.A (E) = \frac{M.A_1 \cdot X\% + M.A_2 \cdot Y\% + \dots}{100}$$

RESOLVER as questões **5 e 6**.



RESOLUÇÃO LISTA II

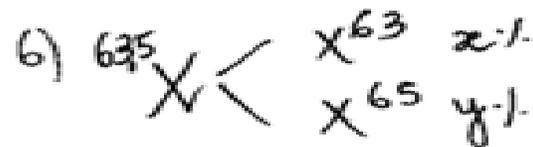


usamos a média aritmética ponderada:

$$M.A(X) = \frac{M.A_1 \cdot x\% + M.A_2 \cdot y\%}{100}$$

$$M.A(Cu) = \frac{62,96 \cdot 70,5 + 64,96 \cdot 29,5}{100}$$

$$M.A(Cu) = \frac{4438,68 + 1916,32}{100} = \frac{6355}{100} = \boxed{63,55}$$



$$63,5 = \frac{63 \cdot x + 65 \cdot y}{100}$$

$$x + y = 100\%$$

$$x = 100 - y$$

$$6350 = 63x + 65y$$

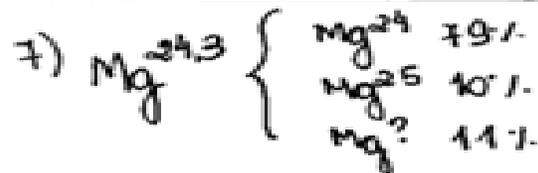
$$6350 = 63(100 - y) + 65y \Rightarrow 6350 = 6300 - 63y + 65y$$

$$6350 - 6300 = 2y \Rightarrow 2y = 50 \Rightarrow \boxed{y = 25\%}$$

$$\boxed{x = 75\%}$$

Resposta

$${}^{63}X \text{ } x\% \rightarrow \boxed{75\%}$$



A soma das % = 100 %

$$24,3 = \frac{24 \cdot 79 + 25 \cdot 10 + x \cdot 11}{100}$$

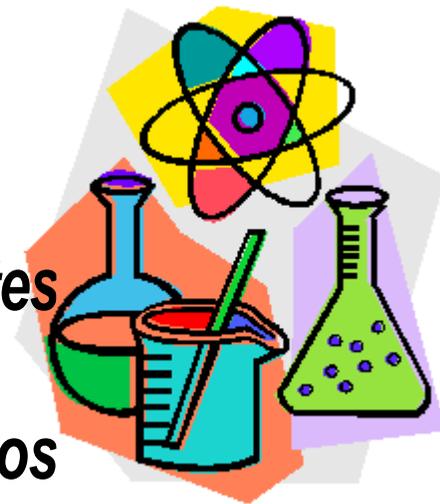
$$2430 = 1896 + 250 + x \cdot 11$$

$$2430 = 2146 + 11x$$

$$2430 - 2146 = 11x \Rightarrow 284 = 11x \Rightarrow x = \boxed{25,8}$$

letra b

RESOLUÇÃO LISTA III



Para realização das questões de estequiometria devemos seguir os seguintes passos:

1º passo: As reações devem ser balanceadas corretamente, lembrando que os coeficientes indicam as proporções em mols dos reagentes e produtos;

2º passo: Estabeleça uma proporção entre o que foi dado e o que foi pedido escrevendo corretamente as informações em massa, volume, mols, moléculas, etc.

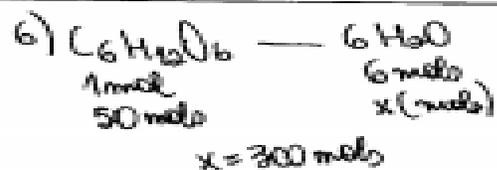
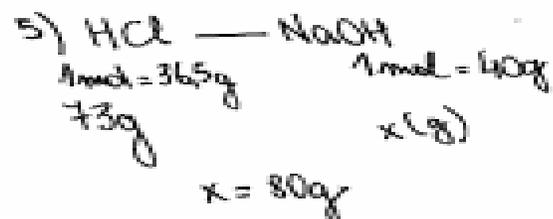
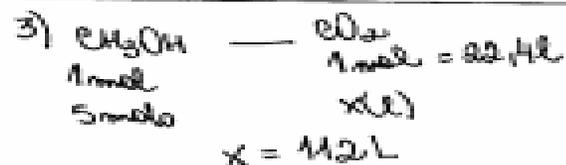
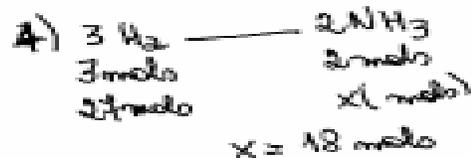
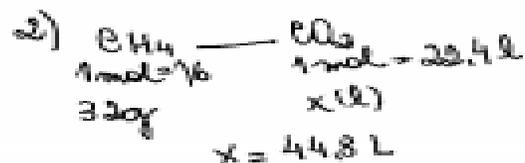
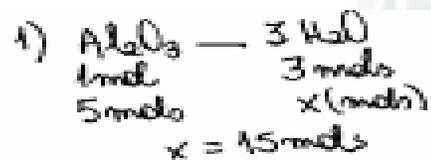
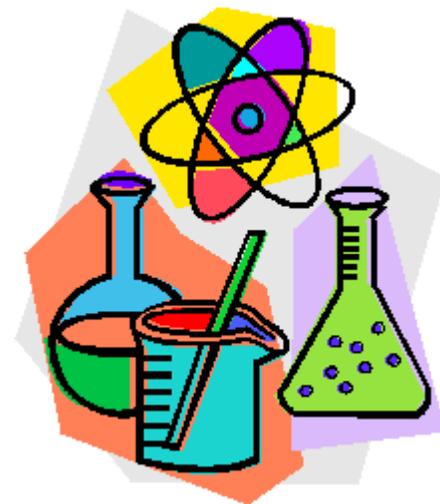
3º passo: Relacione, por meio de uma regra de três, os dados e a pergunta do problema.

4º passo: Ficar atento aos casos particulares (reagentes impuros, rendimento \neq de 100%, reagente excedente/limitante, reações consecutivas).

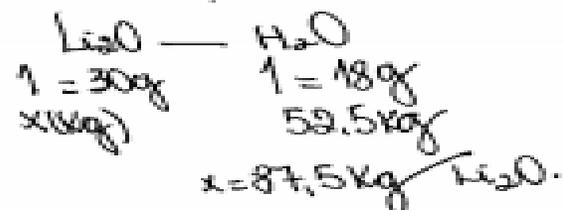
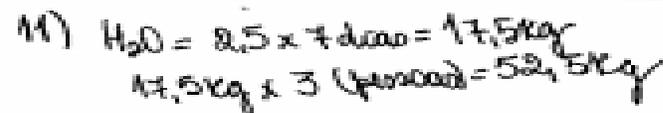
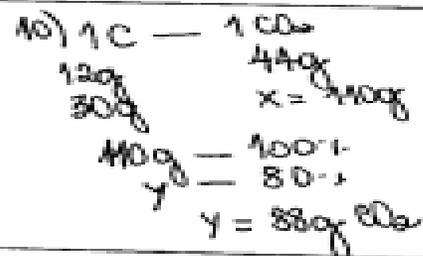
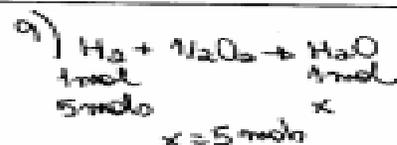
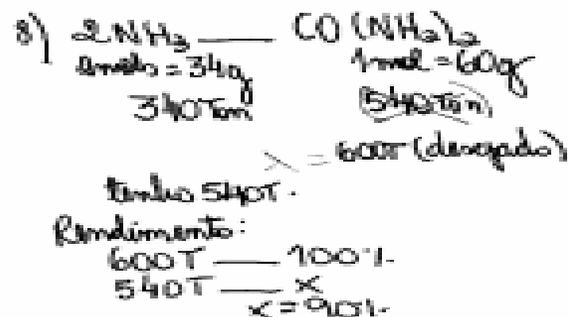
Adote: Avogadro : $6 \cdot 10^{23}$ Volume molar nas CNTP = 22,4 litros

Resolver as questões 14 e 18.

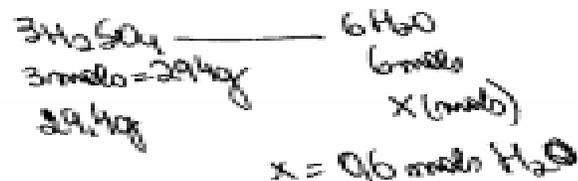
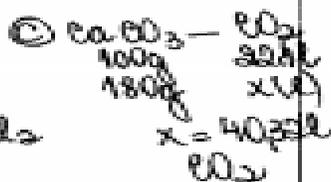
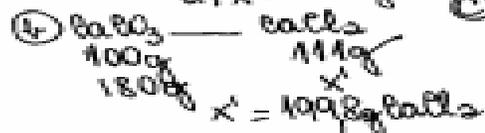
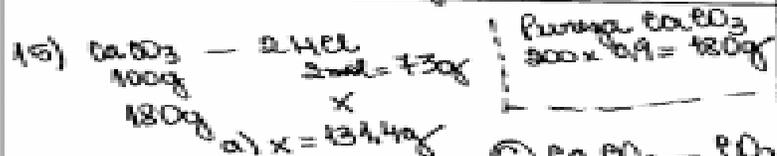
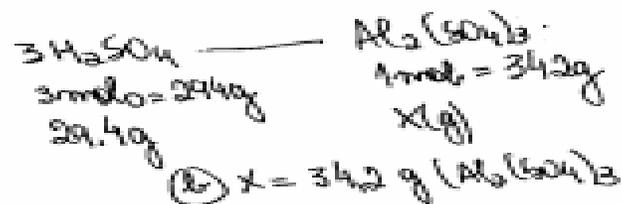
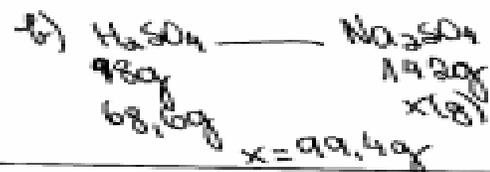
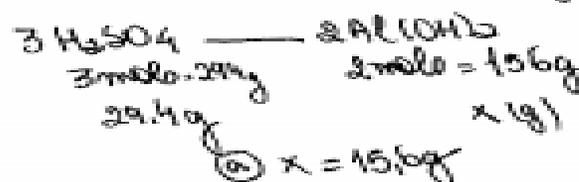
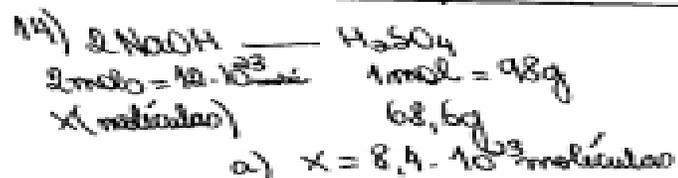
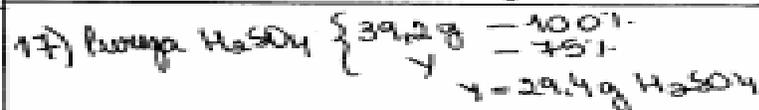
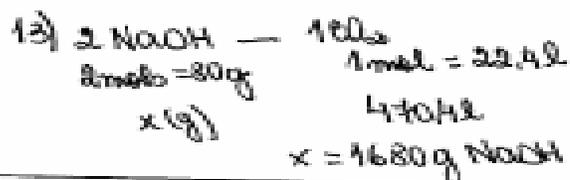
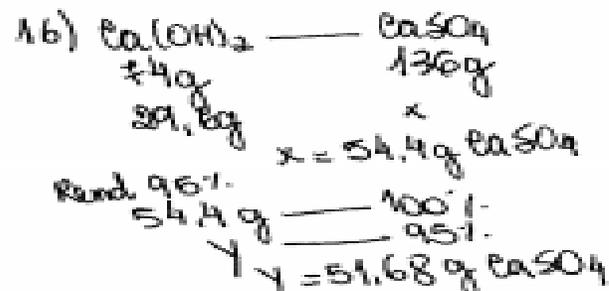
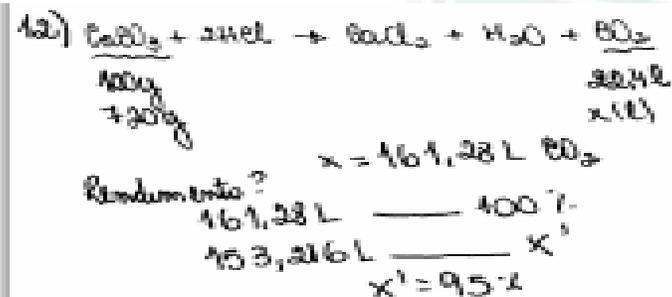
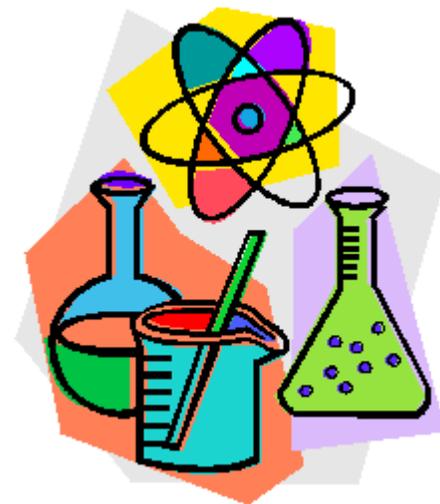
RESOLUÇÃO LISTA III



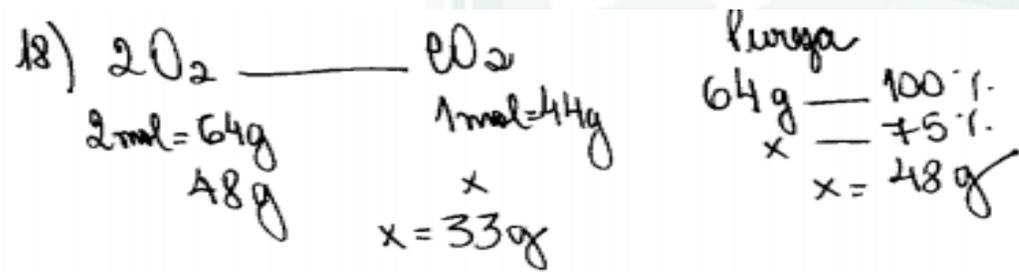
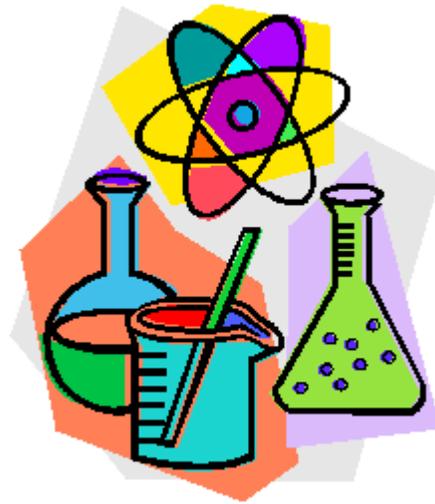
7) OK (já tem resposta)



RESOLUÇÃO LISTA III



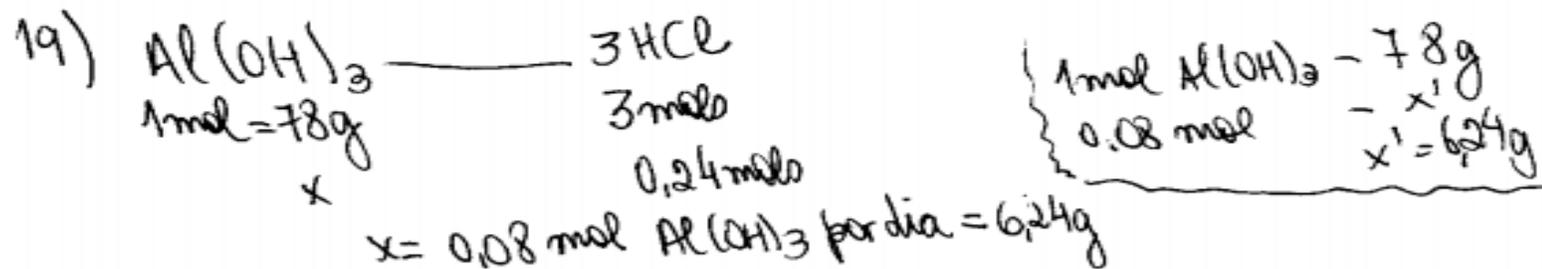
RESOLUÇÃO LISTA III



Rendimento?

$$\frac{33\text{g}}{26,4\text{g}} = \frac{100\%}{x'}$$

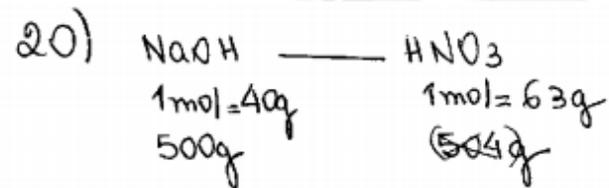
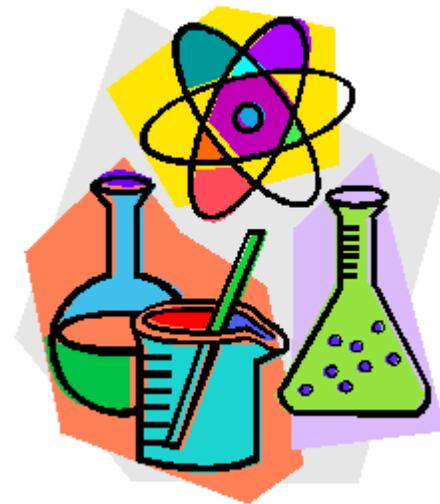
$x' = 80\%$



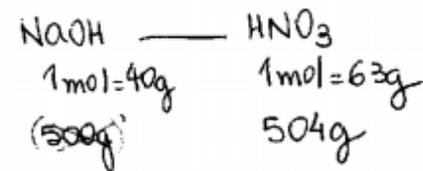
$$\frac{26\text{g } \text{Al}(\text{OH})_3}{6,24\text{g}} = \frac{1000\text{ ml}}{x}$$

$x = 240\text{ ml}$

RESOLUÇÃO LISTA III



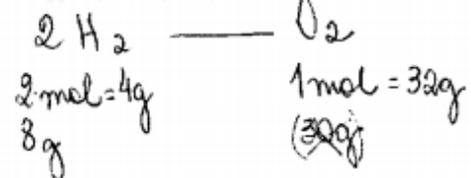
$x = 787,5 \text{ g HNO}_3$ (desafado)
tenho 504g, logo
 $\text{HNO}_3 \rightarrow \text{R.L.}$
A) $\text{NaOH} \rightarrow \text{R.E.}$



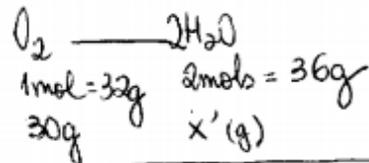
$x' = 300 \text{ g NaOH}$ (desafado)
tenho 500g
logo, esta em excesso
B) $\text{NaOH} = 180 \text{ g}$

21) Para determinar o máximo do produto (H_2O)
obtido usaremos o Reagente Limitante (R.L).

1º) Qual o R.L? O_2

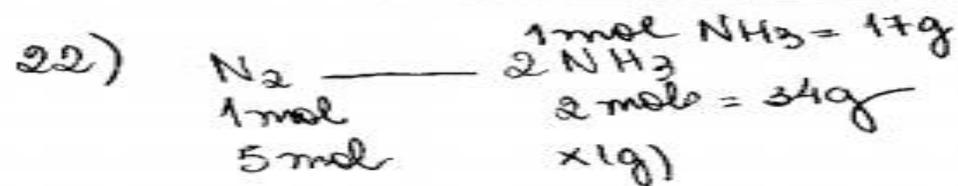
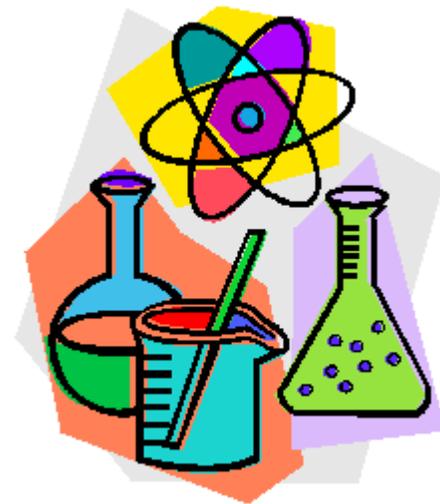


$x = 64 \text{ g}$ (desafado)
tenho 30g, logo O_2 (R.L)



$$x' = 33,75 \text{ g H}_2\text{O}$$

RESOLUÇÃO LISTA III



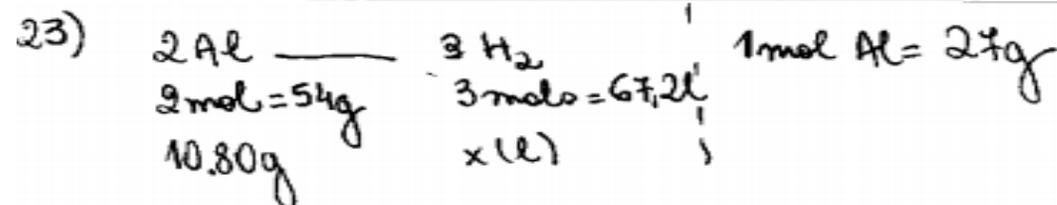
$$x = 170 \text{ g}$$

Rendimento (60%)

$$170 \text{ g} = 100\%$$

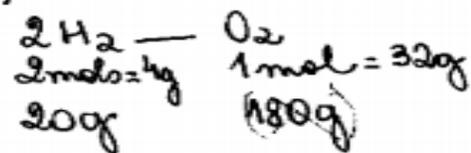
$$x' = 60\%$$

$$x' = 102 \text{ g NH}_3$$



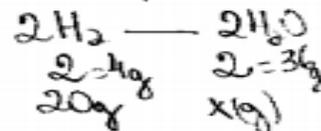
$$x = 13,44 \text{ l H}_2$$

24) 1º descobrir o R. L $\Rightarrow \text{H}_2\text{O}$ (letra D)



$$x = 180 \text{ g (de mols)}$$

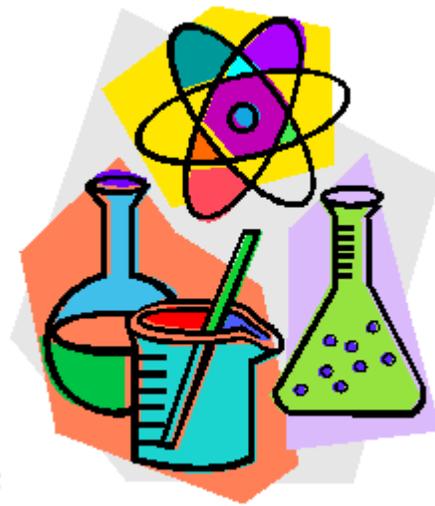
tenho 180g O_2 , logo O_2 (R.L)



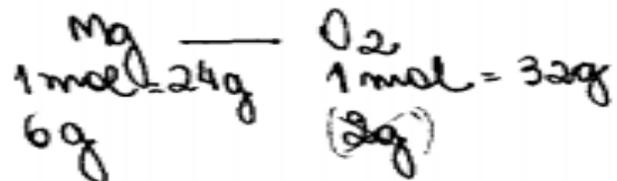
$$x = 180 \text{ g}$$

H_2O

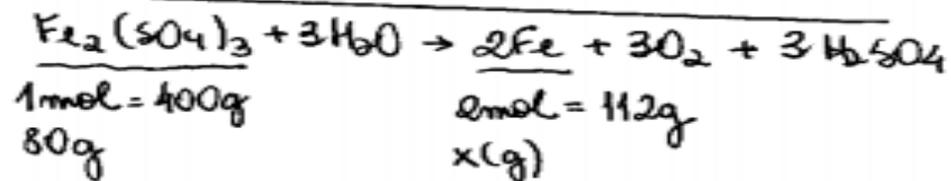
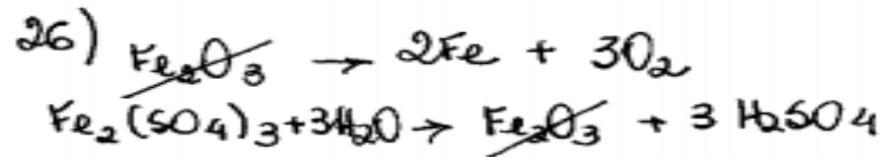
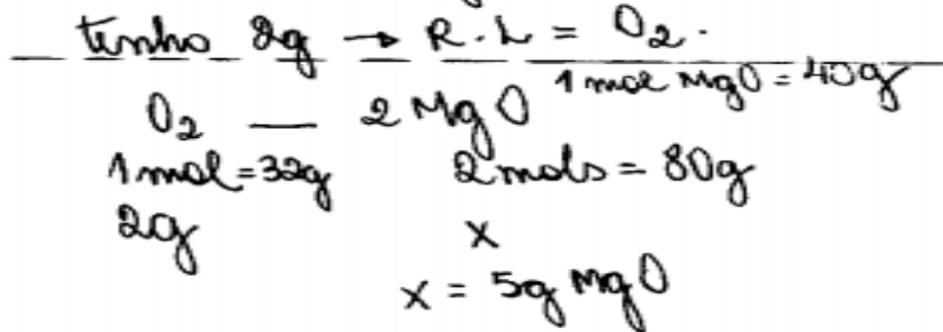
RESOLUÇÃO LISTA III



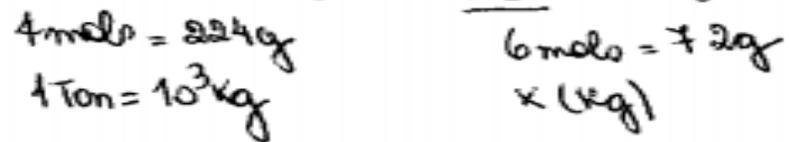
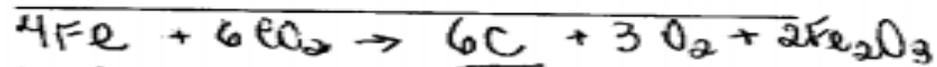
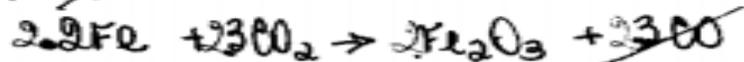
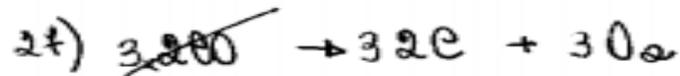
25) 1º → descobrir o R.L



$$x' = 8 \text{ g (desapado)}$$

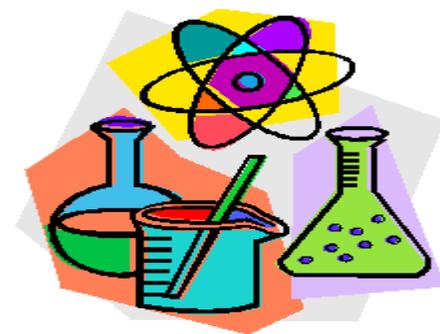


$$\text{letra B.} \quad x = 22,4 \text{ g Fe}$$



$$x = 321,43 \text{ Kg Fe}$$

PRÓXIMA AULA



- Ler cap. 14 do nosso livro II, anotando (RESUMO) as 3 Leis gasosas, a Equação de Clapeyron e resolvendo as questões pedidas, como indicado no roteiro de estudos. BONS ESTUDOS!

FELIZ PÁSCOA!

Que Jesus renasça em você, lembrando-te que não estamos sozinhos, que dependemos um do outro. E, em breve, estaremos juntos e mais fortalecidos. Com fé em DEUS!

SOLEDADE