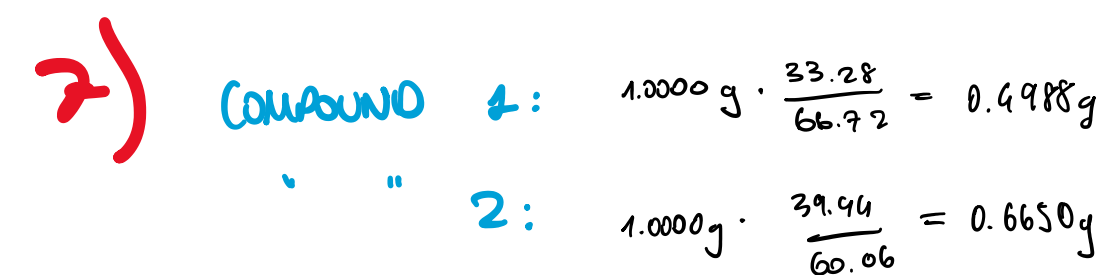
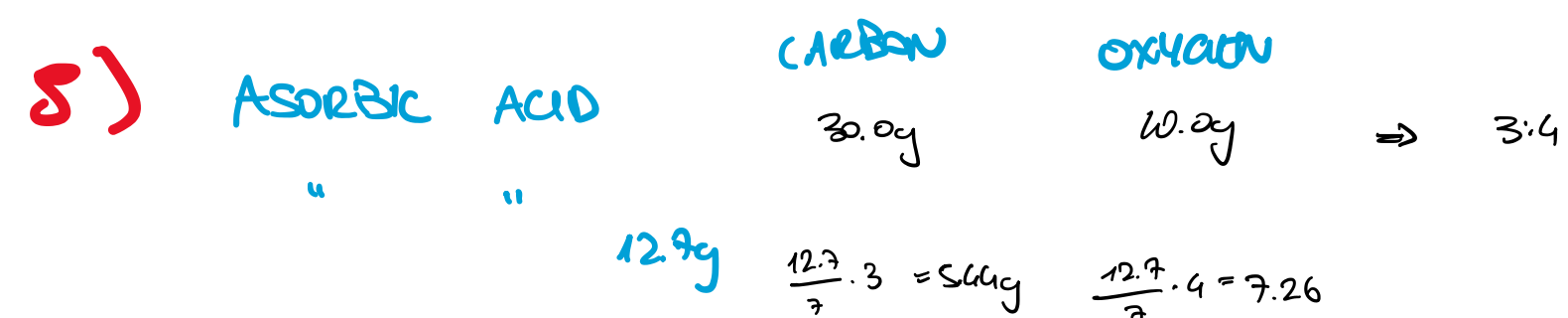


2) SUBSTANCES	MIXTURES
ALCOHOL	MILK
COPPER WIRE	BARIUM BROMIDE
RUST	CONCRETE
	BAKING SODA
	BAKING POWDER



15)  $v = 8.00 \cdot 10^6 \text{ m} \cdot \text{s}^{-1}$

$l = 0.10 \text{ m}$

$F = 200 \text{ V} \cdot \text{m}^{-1}$

$L = 0.95 \text{ m}$

$S = ?$

$$S = \left( \frac{l}{w_e} \right) \left( \frac{l}{|v_x|^2} \right)^2 \left( \frac{L}{\lambda} \right) E$$

$$= 1.758820 \times 10^{-11} \cdot \frac{0.10}{(8 \cdot 10^6)^2} \cdot 0.95 \cdot 200$$

$$= 41.894 \text{ m}$$

$$\approx 42 \text{ m}$$

14)  $A = \sum_i p_i A_i$

$$= \frac{82.21}{100} \cdot 29.9763 + \frac{17.79}{100} \cdot 28.97649$$

$$\rightarrow \frac{3.04}{100} \cdot 24.97376$$

$$= 28.08864 \text{ m}$$

19)  $\left( \frac{19.61}{100} \cdot 10.013 \right) + \left( \frac{80.39}{100} \cdot A_{\text{m}} \right) = 10.811$

$$A_{\text{m}} = 11.00566 \approx 11.006 \text{ m}$$

23)  $A_{\text{m}} \Rightarrow 241 - 95 = 176 \text{ NEUTRONS}$

$\Rightarrow 95 \text{ PROTONS}$

$95 \text{ ELECTRONS}$

30)  $D = 2.88 \cdot 10^{-10} \text{ m}$

1 mol =  $6.02214129 \times 10^{23}$  atoms

$$L = 2.88 \cdot 10^{-10} \cdot 6.02214129 \cdot 10^{23}$$

$$= 1.73637 \cdot 10^{14} \text{ m}$$

$$\approx 1.73 \cdot 10^{14} \text{ m}$$

39)  $r = R(A)^{\frac{1}{3}}$

$$= 1.3 \times 10^{-13} \cdot (127)^{\frac{1}{3}}$$

$$= 6.534 \cdot 10^{-13} \text{ m} \cdot 10^2 = 6.534 \cdot 10^{-11} \text{ cm}$$

$$\rho = \frac{m}{V} = \frac{m}{\frac{4}{3}\pi r^3} = \frac{2.4 \cdot 10^{22} \text{ g}}{\frac{4}{3}\pi (6.534 \cdot 10^{-13})^3} = 1.797 \cdot 10^{14} \text{ g/cm}^3 \gg 4.93 \text{ g/cm}$$

$\Rightarrow$  nucleus is extremely dense

40)  $6.0 \times 10^{56}$  neutrons

$$r = 20 \cdot 10^3 \text{ m} \Rightarrow 20 \cdot 10^5$$

$$m_n = 1.675 \cdot 10^{-24} \text{ g}$$

$$\rho = \frac{m}{V} = \frac{m_n \cdot N_n}{\frac{4}{3}\pi r^3}$$

$$= \frac{1.675 \cdot 10^{-24} \cdot 6.0 \cdot 10^{56}}{\frac{4}{3} \cdot \pi \cdot (20 \cdot 10^5)^3}$$

$$= 2.99907 \cdot 10^{13} \text{ g/cm}^3$$

$^{232}\text{Th} \rightarrow 142 \text{ N}$

$90 \text{ P}$

$$r_{\text{Th}} = 9.1 \cdot 10^{-13} \text{ cm}$$

$$\rho = \frac{M}{V} = \frac{(N_p \cdot m_p) + (N_n \cdot m_n)}{\frac{4}{3}\pi (r)^3}$$

$$= \frac{(90 \cdot 1.673 \cdot 10^{-24}) + (142 \cdot 1.675 \cdot 10^{-24})}{\frac{4}{3}\pi (9.1 \cdot 10^{-13})^3}$$

$$= 1.23052 \cdot 10^{14} \text{ g/cm}^3$$

41)

1. MATTER CONSISTS OF INDIVISIBLE SUBATOMIC ATOMS, MADE UP BY QUARKS

2. ALL ATOMS OF A GIVEN CHEMICAL HAVE AN IDENTICAL NUMBER OF PROTONS AND ELECTRONS, BUT NEUTRONS MAY VARY

3.  $\rightarrow$  DIFFERENT NUMBERS OF PROTONS

4. ATOMS CAN BE SEPARATED IN MANY PROCESSES.