

# ZAD. 1

$$^{206}\text{Pb}/^{204}\text{Pb} = 2702,7$$

$$^{207}\text{Pb}/^{204}\text{Pb} = 688,92$$

$$^{208}\text{Pb}/^{204}\text{Pb} = 188,92$$

$$c(\text{U}) = 767 \text{ ppm}$$

$$c(\text{Pb}) = 478 \text{ ppm}$$

$$^{206}\text{Pb}^*/^{238}\text{U} = ?$$

$$^{207}\text{Pb}^*/^{235}\text{U} = ?$$

$$^{206}\text{Pb} = 2702,7 \times ^{204}\text{Pb}$$

$$^{207}\text{Pb} = 688,92 \times ^{204}\text{Pb}$$

$$^{208}\text{Pb} = 188,92 \times ^{204}\text{Pb}$$

$$^{204}\text{Pb}$$

$$+ \Rightarrow 2702,7 \times ^{204}\text{Pb} + 688,92 \times ^{204}\text{Pb} + 188,92 \times ^{204}\text{Pb} + ^{204}\text{Pb} = 478 \text{ ppm}$$

$$m(^{204}\text{Pb}) = 0,133 \text{ ppm} \Rightarrow n(^{204}\text{Pb}) = \frac{m}{A_r} = 6,44 \times 10^{-4} \text{ mol} / 10^6 \text{ g uranu}$$

$$m(^{206}\text{Pb}) = 360,699 \text{ ppm} \Rightarrow n(^{206}\text{Pb}) = 1,75 \text{ mol}$$

$$m(^{207}\text{Pb}) = 91,872 \text{ ppm} \Rightarrow n(^{207}\text{Pb}) = 0,44 \text{ mol}$$

$$m(^{208}\text{Pb}) = 25,191 \text{ ppm} \Rightarrow n(^{208}\text{Pb}) = 0,12 \text{ mol}$$

$$^{206}\text{Pb}^*/^{238}\text{U} = \frac{\frac{^{206}\text{Pb}}{^{204}\text{Pb}} - \left(\frac{^{206}\text{Pb}}{^{204}\text{Pb}}\right)_0}{\frac{^{238}\text{U}}{^{204}\text{Pb}}} = \frac{\frac{1,75 \text{ mol}}{6,44 \times 10^{-4} \text{ mol}} - 14,2}{4968,5} = \underline{\underline{0,5441}}$$

$$\frac{^{238}\text{U}}{^{204}\text{Pb}} = \frac{c(\text{U}) \cdot w(\text{U})}{A_r(\text{U}) \cdot n(^{204}\text{Pb})} = \frac{767 \text{ ppm} \cdot 0,993}{238,03 \cdot 6,44 \times 10^{-4}} = 4968,5$$

$$\left(\frac{^{206}\text{Pb}}{^{204}\text{Pb}}\right)_0 = 14,2$$

$$\left(\frac{^{207}\text{Pb}}{^{204}\text{Pb}}\right)_0 = 15,0$$

$$w(^{238}\text{U}) = 99,3\%$$

$$\frac{^{235}\text{U}}{^{238}\text{U}} = \frac{1}{137,8} = \text{KONST.}$$

$$^{235}\text{U} = \frac{1}{137,8} \cdot ^{238}\text{U} = 0,007 \times ^{238}\text{U}$$

$$^{238}\text{U} + 0,007 \times ^{238}\text{U} = 100\% \text{ U}$$

$$^{238}\text{U} = 99,3\% \text{ U}$$

ILI:

$$^{238}\text{U} = 99,3\%$$

$$^{235}\text{U} = 0,7\%$$

$$^{234}\text{U} = 0,0054\%$$

} iz literature

masa u ppm

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# ZAD. 1 (nastavak)

$$^{207}\text{Pb}^* / ^{235}\text{U} = ?$$

$$\frac{^{207}\text{Pb}^*}{^{235}\text{U}} = \frac{\left(\frac{^{207}\text{Pb}}{^{204}\text{Pb}}\right) - \left(\frac{^{207}\text{Pb}}{^{204}\text{Pb}}\right)_0}{\frac{^{235}\text{U}}{^{204}\text{Pb}}} = \frac{\frac{0,44}{6,44 \times 10^{-4}} - 15,0}{35,02} = \underline{\underline{19,0813}}$$

$$\frac{^{235}\text{U}}{^{204}\text{Pb}} = \frac{c(\text{U}) \cdot w(^{235}\text{U})}{A_r(\text{U}) \cdot m(^{204}\text{Pb})} = \frac{767 \text{ ppm} \cdot 0,007}{238,03 \cdot 6,44 \times 10^{-4}} = 35,02$$