

zad. 41.5

$$t = 50^\circ\text{C} \Rightarrow T = 323\text{K}$$

$$t_0 = 0^\circ\text{C} \Rightarrow T_0 = 273\text{K}$$

$$\lambda_{st} = 1,2 \cdot 10^{-5} \frac{1}{\text{K}}$$

$$\lambda_{Ag} = 1,9 \cdot 10^{-5} \frac{1}{\text{K}}$$

$$\frac{l_{0, st}}{l_{0, Ag}} = ?$$

$$l_{0, st} - l_{0, Ag} = ?$$

$$\frac{\Delta l}{l_0 \Delta T} = \lambda$$

$$\frac{l - l_0}{l_0 (T - T_0)} = \lambda$$

$$l = l_0 + \lambda l_0 (T - T_0)$$

$$l = l_0 (1 + \lambda (T - T_0))$$

$$l_{st} = l_{0, st} (1 + \lambda_{st} (T - T_0))$$

$$l_{Ag} = l_{0, Ag} (1 + \lambda_{Ag} (T - T_0))$$

$$l_{st} = l_{Ag}$$

$$l_{0, st} (1 + \lambda_{st} (T - T_0)) = l_{0, Ag} (1 + \lambda_{Ag} (T - T_0))$$

$$\frac{l_{0, st}}{l_{0, Ag}} = \frac{1 + \lambda_{Ag} (T - T_0)}{1 + \lambda_{st} (T - T_0)}$$

$$\frac{l_{0, st}}{l_{0, Ag}} = \frac{1 + 1,9 \cdot 10^{-5} \frac{1}{\text{K}} \cdot (323\text{K} - 273\text{K})}{1 + 1,2 \cdot 10^{-5} \frac{1}{\text{K}} \cdot (323\text{K} - 273\text{K})}$$

$$\frac{l_{0, st}}{l_{0, Ag}} = \frac{1 + 0,00095}{1 + 0,0006}$$

$$\frac{l_{0, st}}{l_{0, Ag}} \approx 1,0003$$

$$l_{0, st} - l_{0, Ag} = 1,0003 l_{0, Ag} - l_{0, Ag}$$

$$l_{0, st} - l_{0, Ag} = 0,0003 l_{0, Ag}$$

Nie da się wyznaczyć różnicy długości sztabek, ponieważ nie znamy ich początkowej długości