

### Cálculo da Incerteza da densidade:

$$\rightarrow \sigma_p = \bar{\rho} \cdot \sqrt{\left(\frac{\sigma_m}{\bar{M}}\right)^2 + \left(\frac{2 \cdot \sigma_D}{\bar{D}}\right)^2 + \left(\frac{\sigma_H}{\bar{H}}\right)^2}$$

$$\rightarrow \sigma_p = 0,004483316275 \cdot \sqrt{\left(\frac{0,03}{16,3}\right)^2 + \left(\frac{0,71}{16,4}\right)^2 + \left(\frac{0,5}{17}\right)^2}$$

$$\rightarrow \sigma_p = 0,004483316275 \cdot 0,052342087$$

$$\rightarrow \sigma_p = 0,0002346661311 \text{ g/mm}^3$$

0,000427

### Notação Final Densidade (g/mm<sup>3</sup>):

$$\rightarrow \rho = \bar{\rho} \pm \sigma_p$$

$$\rightarrow \rho = 0,004483316275 \pm 0,0002346661311$$

$$\rightarrow \rho = 0,004717982406 \text{ g/mm}^3$$

$(11,5 \pm 0,4) \cdot 10^{-3}$

### Erro Relativo:

$$\rightarrow E\% = \frac{|X_m - X_v|}{X_v} \times 100$$

$$\rightarrow E\% = \frac{|0,004483316275 - 0,0047|}{0,0047} \times 100$$

$$\rightarrow E\% = 0,04610292 \times 100$$

$$\rightarrow E\% = 4,610292021\%$$

### Incerteza Experimental Relativa:

$$\rightarrow \sigma\% = \frac{\sigma_p}{\rho} \times 100$$

$$\rightarrow \sigma\% = \frac{0,0002346661311}{0,004483316275} \times 100$$

$$\rightarrow \sigma\% = 0,052342087 \times 100$$

$$\rightarrow \sigma\% = 5,234208713\%$$

5,23%