c) Obliczyć objętości V elementu mierzonego oraz jej niepewność pomiarową uc(V), kulka

| Dane | Wartosc[mm] |
|---|---|
| $u(x)$ | 0.067 |
| $\bar{x}\ -średnicy$ | 8.167 |

Obliczanie Objetosci

$$V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi(\frac{1}{2}d)^3 = \frac{4}{3}\pi\frac{1}{8}d^3 = \frac{1}{6}\pi d^3$$

$$V = \frac{1}{6}\pi d^3 = \frac{1}{6}\pi 8.167^3 = \frac{1}{6}\pi 544.73799 = 90.789666\pi$$

Obliczanie Niepewnosci Objetosci

$$u_c(V) = \sqrt{(\frac{dV}{dx_1}u(x_1))^2}$$

$\frac{dV}{dd}$=$\frac{dV}{dd}$=$\frac{d}{dd}\frac{1}{6}\pi d^3 = \frac{1}{6}\pi 3d^2 = \frac{1}{2}\pi d^2$

$\frac{1}{2}\pi d^2 = \frac{1}{2}\pi 66.69989$ = $33.3499445\pi$

$u_c(V) = \sqrt{(\frac{dV}{dx_1}u(x_1))^2} = \sqrt{(\frac{1}{2}\pi d^2 * u(d))^2} =$

$\sqrt{(33.3499445\pi\ * 0.067\ )^2} =$

$\sqrt{(2.23444628\ )^2} = \sqrt{4.99275018}\,\pi =$

$2.23444628\pi \approx 2.3\pi$