

ESPERIMENTO DI MILLIKAN

GOCCIA n° 5

$$\eta = 1,7 \cdot 10^{-4} \frac{\text{N} \cdot \text{s}}{\text{m}^2}$$

$$E = 10^5 \frac{\text{N}}{\text{C}}$$

$$d_{\text{olio}} = 1029 \frac{\text{kg}}{\text{m}^3}$$

$$v_1 = -13,9 \frac{\text{m}}{\text{s}}$$

$$v_2 = 20,1 \frac{\text{m}}{\text{s}}$$

$$q = 1,18 \cdot 10^{-18} \text{ C}$$

$$m = \frac{q}{e} = 6,99 \cdot 10^{-19} \text{ kg}$$

FASE 1: DISCESA

$$r = ?$$

$$P = F_{\text{ATT}}$$

$$mg = 6\pi r \eta v_1$$

$$d_{\text{olio}} \cdot V \cdot g = 6\pi r \eta v_1$$

$$d_{\text{olio}} \cdot \frac{4}{3} \pi r^3 \cdot g = 6\pi r \eta v_1$$

$$r = \sqrt{\frac{6 \cdot v_1 \cdot \eta \cdot 3}{d_{\text{olio}} \cdot 4 \cdot g}} = \sqrt{\frac{6 \cdot 13,9 \cdot 10^{-6} \frac{\text{m}}{\text{s}} \cdot 1,7 \cdot 10^{-4} \frac{\text{N} \cdot \text{s}}{\text{m}^2} \cdot 3}{1029 \frac{\text{kg}}{\text{m}^3} \cdot 4 \cdot 9,81 \frac{\text{m}}{\text{s}^2}}} = 1,026 \cdot 10^{-6} \text{ m}$$

$$r = 1,02635 \cdot 10^{-6} \text{ m}$$

FASE 2: SALITA

$$q = ?$$

$$F_{\text{oe}} = P + F_{\text{ATT}}$$

$$qE = mg + 6\pi r \eta v_2$$

$$\frac{qE}{E} = \frac{6\pi r \eta (v_1 + v_2)}{E} = \frac{6\pi \cdot 1,02635 \cdot 10^{-6} \text{ m} \cdot 1,7 \cdot 10^{-4} \frac{\text{N} \cdot \text{s}}{\text{m}^2} \cdot (20,1 + 13,9) \cdot 10^{-6}}{10^5 \frac{\text{N}}{\text{C}}}$$

$$q = 1,18 \cdot 10^{-18} \text{ C}$$