

Electrics

1. On a glass stick (which was rubbed by a fur) originated a charge with the value 80 nC. How many electrons moved from the stick to the fur? How was the mass of the stick reduced? (charge of electron = $-1.602 \cdot 10^{-19}$ C, mass of electron = $9.1 \cdot 10^{-31}$ kg)
2. Two same size, infinitesimally small spheres have electric charge $Q_1 = 24 \cdot 10^{-6}$ C and $Q_2 = -18 \cdot 10^{-6}$ C. Find the attracting force, if they are separated by distance $r = 6$ cm in the vacuum. Next, find the repulsive force at the same distance, if the spheres touch each other before separating.
3. There are two fixed charges separated by distance L. The charges are: $Q_1 = Q$ C and $Q_2 = 4Q$ C. Find the position of the charge Q_3 (on the abscissa connecting Q_1 and Q_2) that there will be no force acting on it.
4. Compare electrical and gravitational forces – for a case with 2 electrons in a distance 10 micrometres (in vacuum) ($G = 6.67 \cdot 10^{-11}$ N·m²·kg⁻²).

HW: Two point charges, $Q_1 = 6 \mu\text{C}$ and $Q_2 = 24 \mu\text{C}$, are 12 cm apart. Find the point (measured from Q_1) where a third charge Q_3 feels zero net force.