Tema V

Vicente Eduardo Martinez Morales[1]

[1]Tecnológico Nacional de México - Campus Zacatecas Occidente

October 31, 2019

PROBLEMA 1

tres partículas cargadas están formadas en un linean como se muerta en la figura(Fig 1)

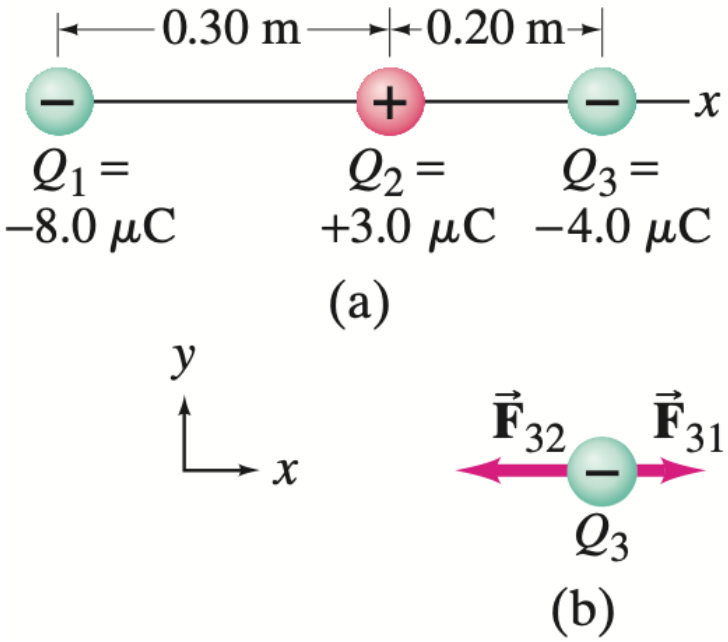

Figure 1: This is a caption

calcule la fuerza electrostática sobre la partícula 3 (4.0mc)desde las dos cargas

$$f_{32} = k\ \frac{Q_3\ Q_2}{r_{32}} = \left(9x10^9\ \frac{nm^2}{c^2}\right)\left(\frac{(-4x10^{-6}c)(3x10^3c)}{(0{,}20m)^2}\right) = 2.7n$$

$$f_{31} = k\ \frac{Q_3\ Q_1}{r_{31}} = \left(9x10^9\ \frac{nm^2}{c^2}\right)\left(\frac{(-4x10^{-6}c)(8x10^{-6}c)}{(0{,}50m)^2}\right) = 1.15n$$

PROBLEMA 2

calcule la fuerza electrostática neta sobre la carga Q3 de brea calcular la fuerza entre Q1 y Q2 (Fig.2)

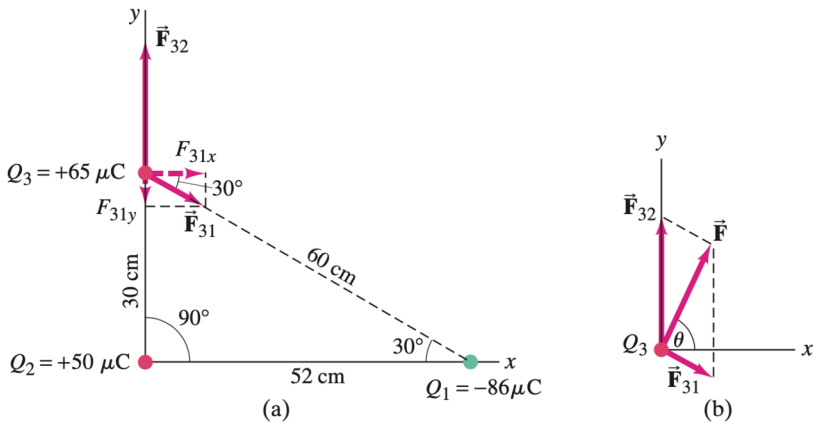

Figure 2: This is a caption

$$f_{32} = k\ \frac{Q_3\ Q_2}{r_{32}} = \left(9x10^9\ \frac{nm^2}{c^2}\right)\left(\frac{(65x10^{-6}c)(50x10^{-6}c)}{(0.03m)^2}\right) = 325n$$

$$f_{31} = k\ \frac{Q_3\ Q_1}{r_{31}} = \left(9x10^9\ \frac{nm^2}{c^2}\right)\left(\frac{(-86x10^{-6}c)(86x10^{-6}c)}{(0{,}06m)^2}\right) = 139.75n$$

PROBLEMA 3

What is the magnitude of the electric force of attraction between an iron nucleus *(q = + 26e)* and its innermost electron if the distance between them is 1.5 X 10-12 m?

$$f_{31} = k\ \frac{Q_3\ Q_1}{r_{31}} = \left(9x10^9\ \frac{nm^2}{c^2}\right)\left(\frac{(26(-1.602x10^{-19}c))(-1.602x10^{-19}c)}{(1.5x10^{-12}m)^2}\right) = 2.67n$$

PROBLEMA 4

What is the repulsive electrical force between two protons 4.0 X 10-15 m apart from each other in an atomic nucleus?

$$f = k\ \frac{Q_3\ Q_1}{r_{31}} = \left(9x10^9\ \frac{nm^2}{c^2}\right)\left(\frac{(1.602x10^{-19}c)(1.602x10^{-19}c)}{(4.0x10^{15}m)^2}\right) = 14.43N$$

PROBLEMA 5

Compare the electric force holding the electron in orbit (r =0.53 X 10-10 m) around the proton nucleus of the hydrogen atom, with the gravitational force between the same electron and proton. What is the ratio of these two forces?

$$1Fg = g\ \frac{m_1\ m_2}{r} = \left(1.672x10^{-27}\ \frac{m^3}{kgs^2}\right)\left(\frac{\left(9.1x10^{-31}c\right)\left(1.602x10^{-19}c\right)}{(0.53x10^{10}m)^2}\right) = 134N$$

$$f = k\ \frac{Q_3\ Q_1}{r_{31}} = \left(9x10^{9}\ \frac{nm^2}{c^2}\right)\left(\frac{\left(1.602x10^{-19}c\right)\left(-1.602x10^{-19}c\right)}{(0.53x10^{10}m)^2}\right) = 123N$$