Charge Example Problems

Monday, March 17, 2014   11:15 AM

$1\,cm = 10^{-2}\,m$

$1\,mm = 10^{-3}\,m$

$1\,\mu C = 10^{-6}\,C$

- How many electrons are in 3.5 micro Coulombs?

$3.5\,\mu C = 3.5 \times 10^{-6}\,C$

$3.5 \times 10^{-6}\,\cancel{C} \left| \dfrac{1e}{1.6 \times 10^{-19}\,\cancel{C}} \right| = 2.19 \times 10^{13}\,e$

A lightning bolt has a charge of 1 to 10 C. How many electrons is this?

$1C \left| \dfrac{1e}{1.6 \times 10^{-19}\,C} \right| = 6.25 \times 10^{18}\,e$

$10\,C \left| \dfrac{1e}{1.6 \times 10^{-19}\,C} \right| = 6.25 \times 10^{19}\,e$

A particle has a charge of +6 micro Coulombs. How many protons is this?
What would happen if the charge is -6 micro Coulombs?

$+6\,\mu C = 6 \times 10^{-6}\,C$

$6 \times 10^{-6}\,C \left| \dfrac{1\,p}{1.6 \times 10^{-19}\,C} \right| = 3.75 \times 10^{13}\,protons$

" " electrons

After charge an object it now has 9.7 Me. What is its charge in Coulombs?

$9.7\,Me = 9.7 \times 10^{6}\,e$

$1M\ 10^{6}$

After charge an object it now has 9.7 Me. What is its charge in Coulombs?

$$9.7 \, Me = 9.7 \times 10^6 \, e$$

$$9.7 \times 10^6 \, e \left| \frac{1.6 \times 10^{-19} \, C}{1 \, e} \right| = 1.55 \times 10^{-12} \, C$$

1M 10^6
1km 10^3
1m

An object has a charge of -12 nC. How many electrons is this?

$$1 \, nC = 1 \times 10^{9} \, C$$

$$-12 \times 10^{-9} \, C \left| \frac{1 \, e}{1.6 \times 10^{-19} \, C} \right| = 7.5 \times 10^{10} \text{ electrons}$$

neg = electrons