

Source: [KB20200824163718]

1 | Coulomb's Law

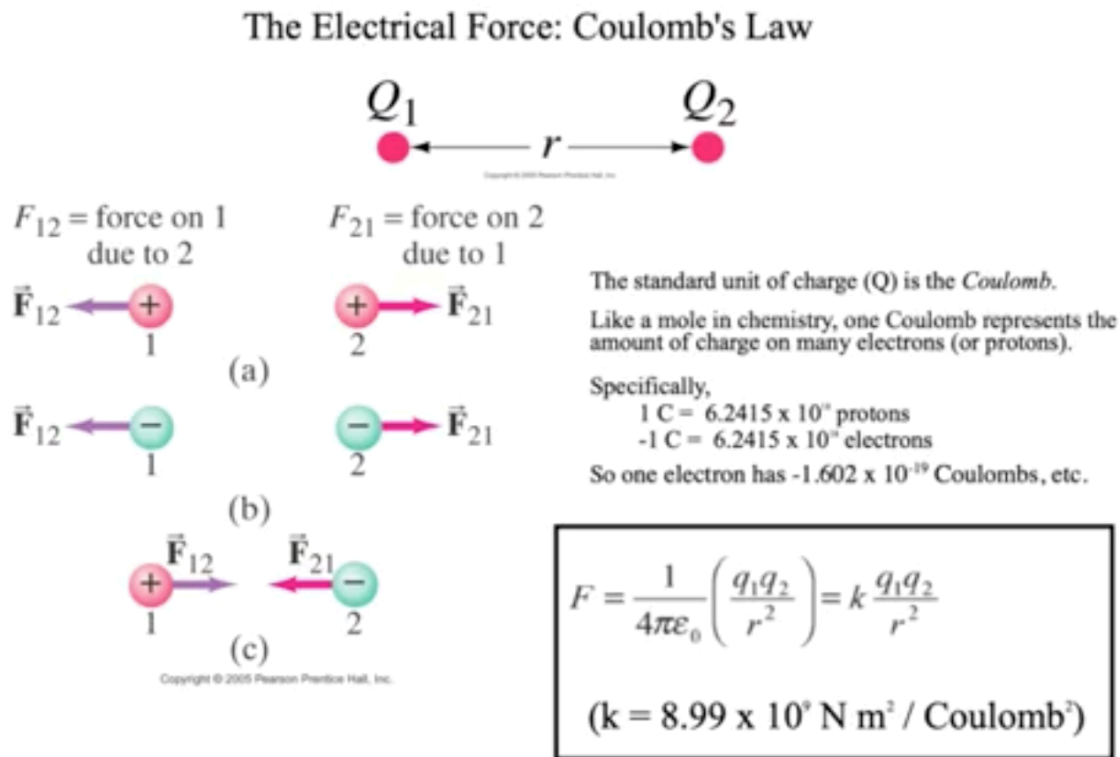


Figure 1: Screen Shot 2020-08-24 at 7.40.48 PM.png

- Electrical forces gets stronger as charge increases
- Electrical forces gets weaker as charge decreases

The magnitude of force between two charges is given by the Coulomb's Law

Definition 1 · **Coulomb's Law** $k \frac{q_1 q_2}{r^2}$

where k , a constant for charge, q_1 , charge of first particle, q_2 , charge of second particle, r^2 , distance squared

Note! The Standard Unit of Charge (Q) is the Coulomb — a representation for charge for many electrons or many protons

Remember this!

Definition 2 · **Charge of an Electron** $-1.602 \times 10^{-19} Q$

Definition 3 · **k** $8.99 \times 10^9 \frac{Nm^2}{Q^2}$

E.M. forces, really, are two forces interacting with each other

Notice! Be careful with the signs when applying coulombs law

- If resulting Coulomb force > 0 , force is REPULSIVE (became you multiplied positive to positive or negative negative)
- If resulting Coulomb force < 0 , force is ATTRACTIVE (became you multiplied positive to negative)

Guided Problem Solve

Special care must be taken for solving these problems w.r.t. to both vector direction and multiple-atom-interactions [\[KB20200824224339\]](#)

Here's something! DNA Replication

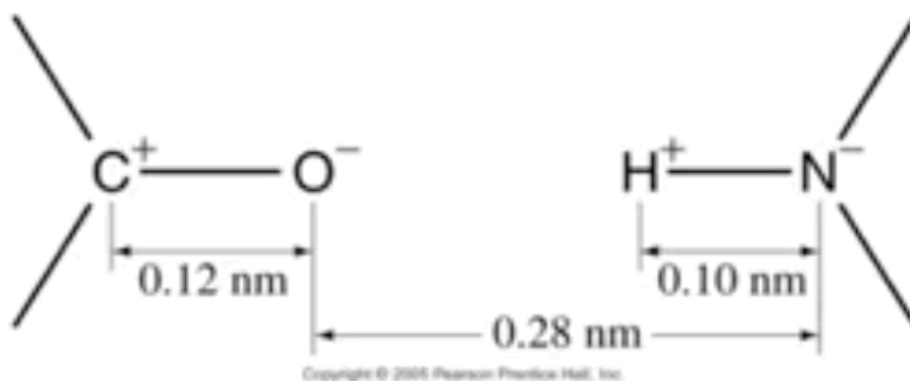


Figure 2: Screen Shot 2020-08-24 at 8.20.15 PM.png

The question is... Between these four atoms, *how many do we need to calculate to find if these two repel or attract?*

This is fairly simple. Because of the fact every force between each pair of atoms between these two elements needs to be calculated. So... 2 (on the left) times 2 (on the right) = 4.

If these repel, the don't combine. If they attract, of course they do.