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1. A glass object is charged to $+3 n \mathrm{n}$ by rubbing it with silk. Explain how this happened.
2. A 27.0 g ball of Aluminum that was electrically neutral is given a charge of +1.6 microcoulombs. How many electrons were removed? What fraction of the original electrons is this?
3. Two identical metal spheres are placed with their centers .30 m apart. One has a charge of 12 nC and the other -18 nC . a.) Find the force between the two. b.) If the spheres are touched together and then placed at back at the original distance what is the force?
4. Two identical .200 g metal spheres are suspended from the same point on the ceiling with 30.00 cm thread. The spheres are charged and then touched together. This causes the angle between them to be $10.00^{\circ}$. What is the magnitude of the charge of each?
5. Three charges are arranged along the $x$ and $y$ axes as such; at $0 \mathrm{~m}, 0 \mathrm{~m}$ a 5.00 nC , at $.300 \mathrm{~m}, 0 \mathrm{~m}$ a 6.00 nC and at $0 \mathrm{~m},-.100 \mathrm{~m}$ a -3.00 nC . Find the force on the charge at the origin.
6. In a hydrogen atom, what are the direction and magnitude of the electric field set up by the proton at the location of the ground state electron?
7. Three positive charges are situated on a grid at the following coordinates; 6.00 nC @ (.600m, 0m), 3.00nC @ ( $0 \mathrm{~m},-.200 \mathrm{~m}$ ), $5.00 \mathrm{nC} @(.600 \mathrm{~m},-.200 \mathrm{~m})$. What is the direction and magnitude of the electric field at $(0 \mathrm{~m}, 0 \mathrm{~m})$ ?
8. Draw the field lines of two oppositely charged particles that have a $4: 1$ ratio.
9. A Van de Graaf generator is charged so that the electric field at its surface is $3.00 \times 10^{4} \mathrm{~N} / \mathrm{C}$. Find the force exerted and the acceleration on a proton at the surface.
