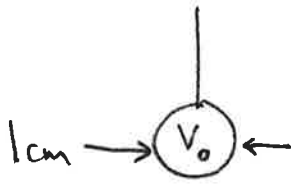


EX 4.3 (Potential of N charged spheres)



Initially, sphere 1 is given a voltage (electric potential) of 1000 volts ($= V_0$)

Since the capacitance of a 1 cm dia. sphere is $C = 4\pi\epsilon_0 R = 5.56 \times 10^{-13}$ Farads,

the charge on this sphere is $q = CV = 55.6 \text{ nCoulombs}$,

When this sphere is touched to a second (identical) sphere, they achieve the same potential. Since they have the same capacitance, they will have the same charge. If the second sphere is now touched to a third, the charge on the second is divided among spheres 2 and 3. This can be continued, as shown here, which describes the final charge of all N spheres.

<u>Sphere</u>	<u>charge</u>	<u>potential</u>
1	$q/2$	$V_0/2$
2	$q/4$	$V_0/4$
3	$q/8$	\vdots
4	\vdots	\vdots
\vdots	\vdots	\vdots
N	$q/2^N$	$V_0/2^N$