Question #53449, Physics / Electric Circuits |

125 drops of water having potential of each 100 V . find the potential of bigger drop.

Answer:

The potential of one drop is defined:

e = kq/r, where k-the constant, q –the charge and r – radius of a drop.

The bigger drop has a volume of $(4/3)\times\pi R^3$ which equals the sum volume of all drops $125\times(4/3)\times\pi r^3$.

Since $(4/3)\times\pi R^3 = 125\times(4/3)\times\pi r^3$, $R = (125)^{1/3}\times r = 5r$.

Thus, the potential of bigger drop is:

E = kQ/R, where Q – the total charge being of 125q, and R- the radius.

After substitution of all parameters the potential of bigger drop is defined:

E =125kq/(5r) = 25 kq/r = 25e = 2500 V