

## 2.4: Finding Avogadro's Number

This use of Avogadro's number raises the question of how we know its value. There are numerous ways to measure Avogadro's number. One such method is to divide the charge of one mole of electrons by the charge of a single electron. We can obtain the charge of a mole of electrons from electrolysis experiments. The charge of one electron can be determined in a famous experiment devised by Robert Millikan, the "Millikan oil-drop experiment". The charge on a mole of electrons is called the *faraday*. Experimentally, it has the value  $96,485 \text{ C mol}^{-1}$  (coulombs per mole). As determined by Millikan's experiment, the charge on one electron is  $1.6022 \times 10^{-19} \text{ C}$ . Then

$$\left( \frac{96,485 \text{ C}}{\text{mole electrons}} \right) \left( \frac{1 \text{ electron}}{1.6022 \times 10^{-19} \text{ C}} \right) = 6.022 \times 10^{23} \frac{\text{electrons}}{\text{mole electrons}}$$

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