

## The Electron Volt (eV) as a unit of Energy

Remember the relationship

$$Work = V \times q$$

Expressing the work (energy) done on a charge  $q$  when it is accelerated by  $V$  Volt potential difference.

In nuclear physics an alternative unit of energy is frequently used, the **Electron Volt (eV)** defined as *the amount of work done to accelerate one electron by one Volt.*

Hence

$$1 \text{ eV} = 1 \text{ V} \times 1.60 \times 10^{-19} \text{ C} = 1.60 \times 10^{-19} \text{ J}$$

If we want to convert an amount in J to eV we divide the amount in J by  $1.60 \times 10^{-19}$ .

Example:

The energy released in a nuclear reaction is calculated to be  $2.78 \times 10^{-11}$  J.

Expressed in eV this is equivalent to

$$2.78 \times 10^{-11} / 1.60 \times 10^{-19} = 1.74 \times 10^8 = 174 \text{ MeV.}$$