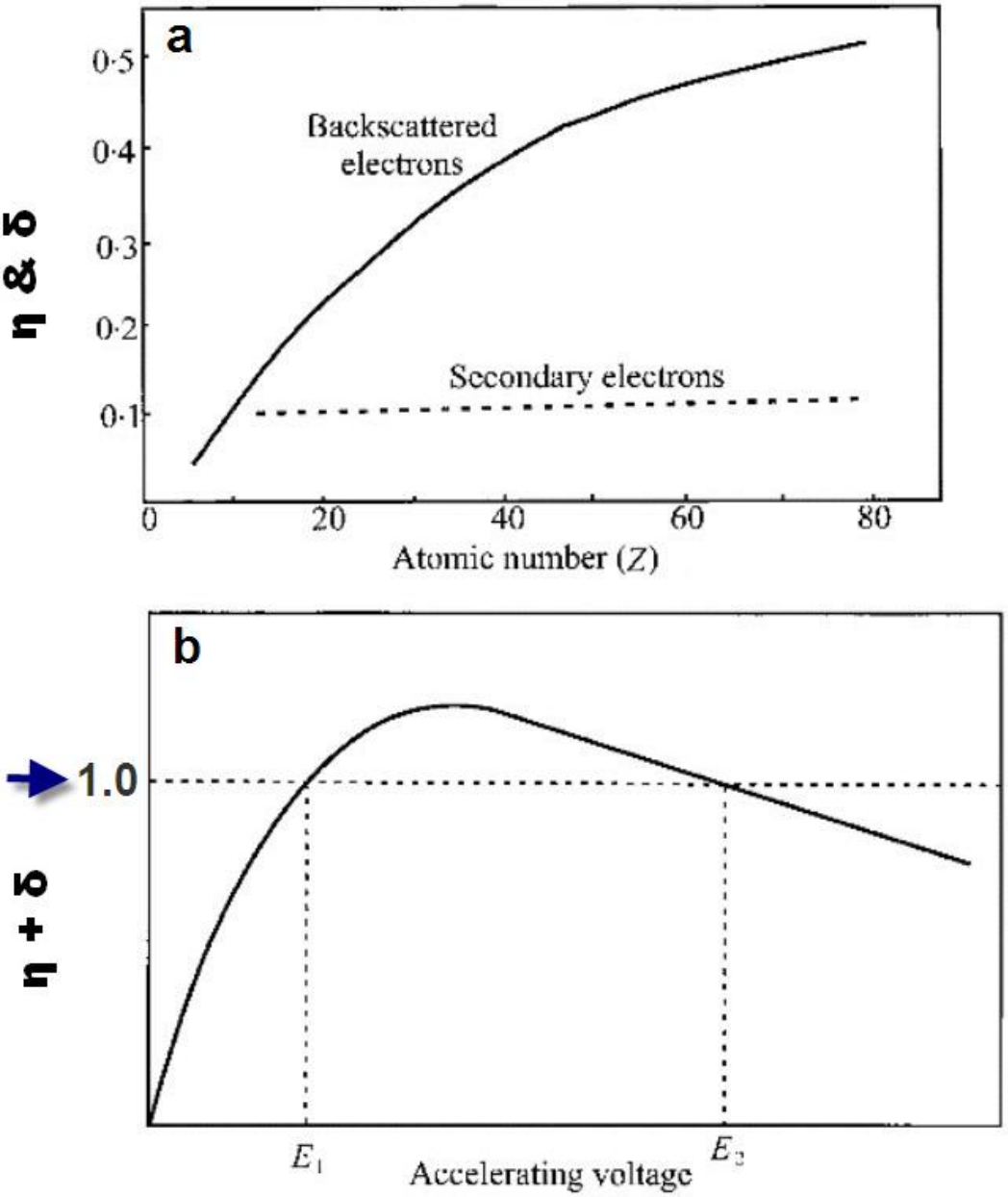
The ideas for the low-voltage SEM (LVSEM)



As we learned early, the backscattered electron coefficient η is strongly dependent on the atomic number of the specimen but the secondary electron coefficient δ is not as shown in Figure (a). The total electron yield is a complex function of accelerating voltage, with a maximum between the crossover points E1 and E2 (around 1-5 keV) as shown in Figure (B). As η is almost independent of voltage, Figure (b) effectively represents the voltage dependence of δ.

If the electron yield is exceed unity, then unless the sample is a conductor, it will tend to become charged during SEM observation. However as shown in Figure (b), by careful control of the accelerating voltage (close to E1 or E2), it can produce an electron yield of unity which will overcome (balance) this charging effect. In practice we prefer to use lower primary electron energy (close to E1) for a better resolution, which is generally known as low-voltage SEM (LVSEM).