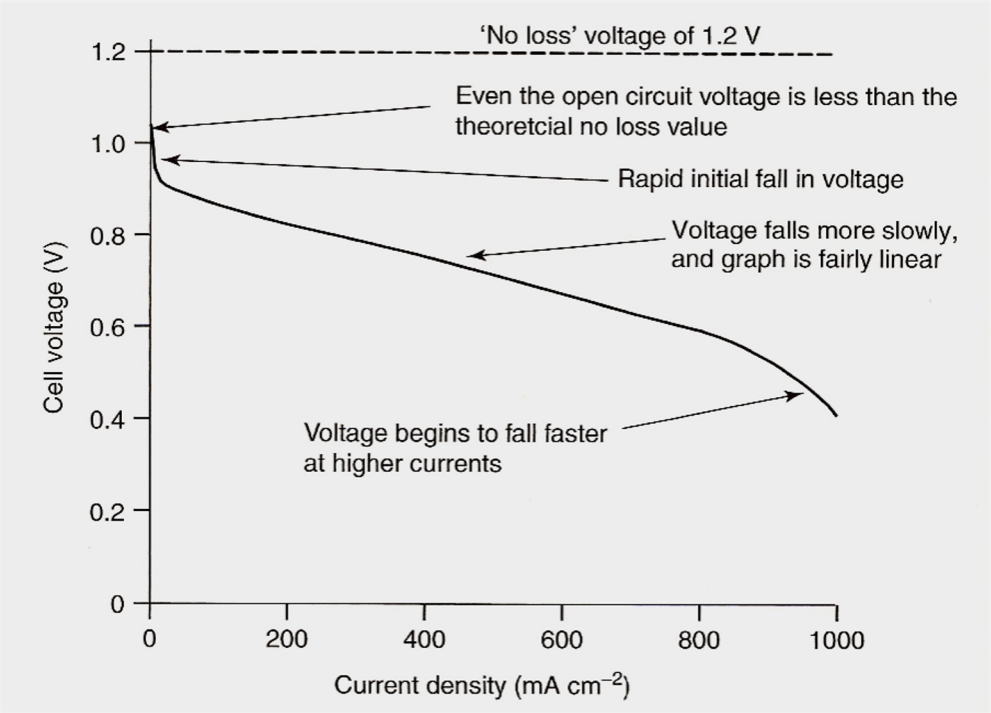
FUEL CELL LOSSES

There is a difference between the voltage that is expected from a fuel cell operating reversibly (ideally) and the voltage that is observed in practice. Five names are commonly used to denote the voltage difference:

- **Overvoltage** is a term often adopted by electrochemists to describe the nonideal behaviour of electrolysers, fuel cells and batteries. Unfortunately, the form of the word overvoltage tends to imply that the observed voltage is larger than the value predicted by theory, whereas in fuel cells the observed voltage is smaller.
- **Polarization** is another term that has been employed by electrochemists, but it is misleading on several counts and is generally best avoided.
- **Irreversibility** is the best term from a thermodynamics point of view. Nonetheless, it is perhaps not sufficiently specific to fuel cells and does not connect well with the main effect under consideration here, namely, that which gives rise to a reduction in cell voltage.
- **Voltage loss** may be taken as a simple way to indicate that a practical fuel cell exhibits a voltage that is less than would be expected from thermodynamic considerations.
- **Voltage drop** is certainly not scientifically precise, but it does convey the effect observed and is readily understood by electrical engineers.



Voltage versus current density performance of a typical fuel cell operating at low temperature and air pressure.