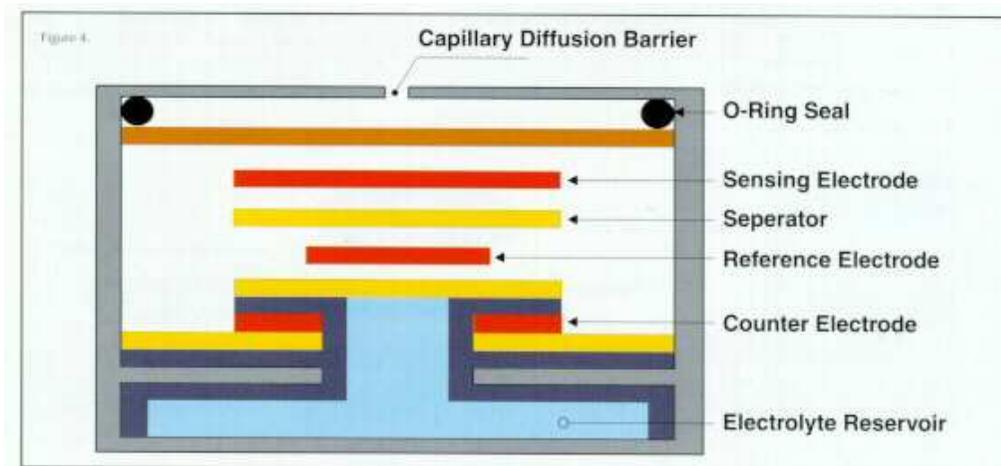


Electrochemical sensors

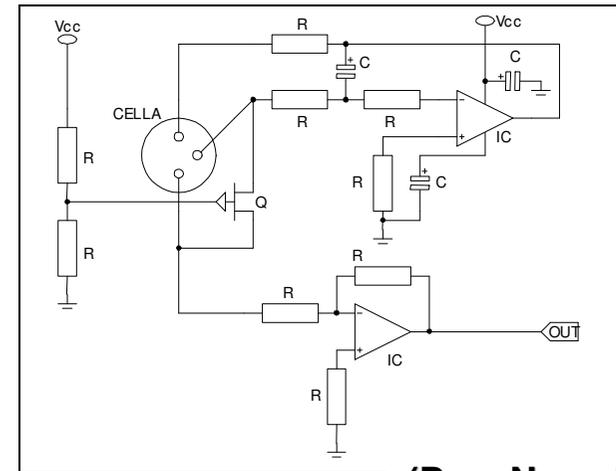
In its most simple form, the electrochemical sensor has two electrodes, “Sensing” and “Counter” which are divided by an electrolyte thin coat. This may be in a liquid state or in a gel state and recently also in a solid state. The electrolyte is isolated towards the outside through a membrane permeable to gas. Gas enters in the sensor by diffusion, through the membrane, and there is an oxidization reaction (reduction that causes an electrical current directly proportional to gas concentration) if a polarization tension is applied to electrodes.



(Doc. City)

Electrochemical sensors

- These kind of sensors need little power and they are usually linear, precise and very sensitive. It is possible to survey very few ppm and the response is generally given between 30 to 60 seconds.



(Doc. Nemoto)

- *Electrochemical sensor lifetime lasts usually 2-3 years except for the oxygen sensor, which life is shorter (1-2 years) because of a quicker reduction and consumption of the electrolyte. It is obvious that the lifetime depends on the gas concentration to detect as the electrode or the electrolyte will be used up by the above mentioned reaction.*

Electrochemical sensors - applications

- This type of sensor is widely used to survey toxic gases, while there are few applications for flammable gases. It is possible to detect hydrogen and CO concentrations up to LEL and oxygen concentrations to 25% of its volume. Low temperature or humidity may reduce sensor sensitivity and for this reason it is advisable to electronically offset the temperature.
- Electrochemical sensors are used to survey a gas in the most specific way. Nevertheless some cross sensitivity relevant to other gases may occur without creating big disadvantages.