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Electrochemical Oxygen Generator

**A convenient and accurate method for the stepless *on line* calibration of O₂ sensors.
With integrated degassing device, generates infinitely variable O₂ concentrations.**

The quality of dissolved oxygen measurements is strongly dependent upon the calibration of the oxygen sensor. Until now oxygen sensors usually have been calibrated by the conventional two-point calibration with oxygen free solutions (e.g. Na₂SO₃) and air. This sometimes causes problems with accuracy. This disadvantage may be avoided, if the electrochemical oxygen generator is used for the determination of the sensor slope of an oxygen sensor. Well-defined oxygen standard solutions will be obtained, if the oxygen is produced continuously by the electrolysis of an alkaline carrier solution in a flow through system. The oxygen concentration is stepless adjustable and depends only on the electrolysis current and on the flow rate of the solution. Therefore it is possible to calibrate sensors with as many concentration/signal pairs as you like. The oxygen generator includes a degassing module, which allows the oxygen normally present in solutions to be reduced down to a very small concentration. Extra degassing is not necessary. The calibration solution circulates in the whole system. That's why the consumption of the carrier solution is minimized.



Figure: Oxygen generator with pump device and storage bottle.

Technical data:

Dimensions of the oxygen generator (LxBxH):	220 mm x 160 mm x 250 mm
Power supply:	230 V
Allowed flow rates:	10...12 ml/min
Concentration range:	0,4 µg/l O ₂ ... 9,95 mg/l O ₂
accuracy of the oxygen concentration:	0,25 %
efficiency of O ₂ removing:	residue oxygen concentration: < 35 µg/l
response time after concentration change:	5 minutes
start phase:	1. degassing: approx. 45 minutes 2. first concentration: approx. 5 minutes

Accuracy of the generated oxygen standard solutions:

The oxygen concentration of the standard solutions was determined by using the Winkler titrimetric method. The titration method was adapted from the German standard method DIN 38408-21.

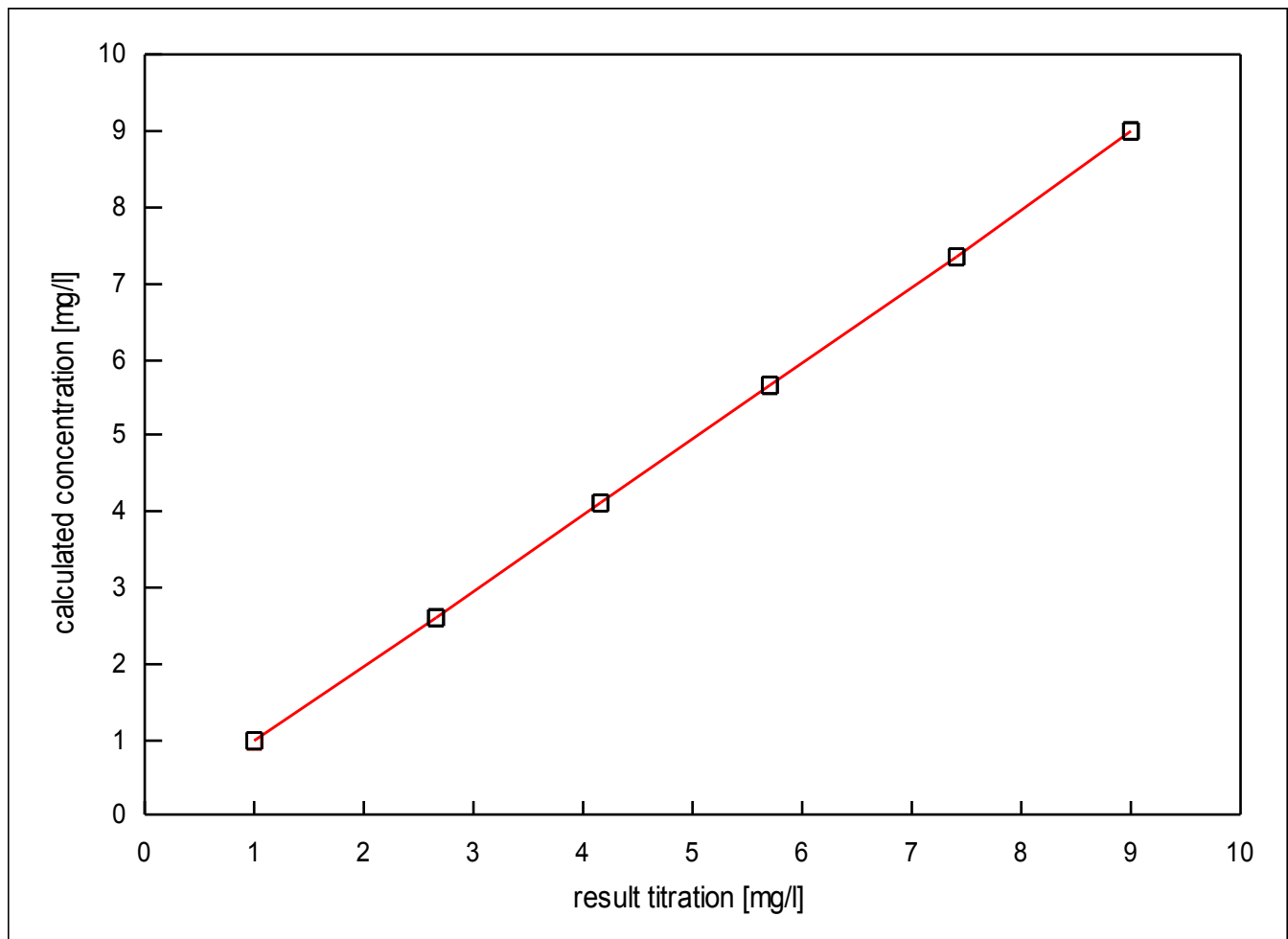


Figure: Comparison between analytical determined and calculated oxygen concentration

The figure shows the comparison between the calculated and the analytically determined (by the Winkler titration method) oxygen concentration. A slope of nearly 1 of the resulting straight line indicate 100 percent current efficiency and complete dissolving of the electrochemically formed oxygen.