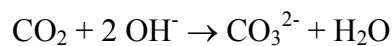


Indirect Impedance Method

As well as direct measurement of impedance in the nutrient broth, the detection of carbon dioxide (CO₂) produced via the microbial metabolism provides the additional option of recording the activity levels of microorganisms. In this process the impedance change is not detected directly in the nutrient, rather it is the change in impedance of a potassium hydroxide solution caused by the uptake of the CO₂ formed.

The chemical reaction between CO₂ and the KOH solution is based on the following chemical equation:



In this case, 1 ml of a 0.2 % KOH solution is placed in a special measuring cell (tightly sealed, with shorter electrodes) and the sample is introduced to the nutrient by means of a separate container into the measuring cell. The measuring cell is then tightly sealed and incubated. The sample vessel must not be completely gas-tight, otherwise the CO₂ created during the incubation period will not be able to escape.

All aerobic proliferating microorganisms produce CO₂ as the final product in the cell metabolism and are therefore suitable for the indirect method.

The microbiologically formed CO₂ is absorbed by the potassium hydroxide solution near the electrodes and the resulting production of potassium carbonate hereby increases the impedance of the solution. The measurement signal therefore indicates negative progress.

The indirect impedance measurement therefore represents a rapid and very simple process with pronounced higher sensitivity for the detection of CO₂ production. For the detection of yeasts and moulds in particular, whose changes occasionally hardly register in the direct method, the indirect method is far superior.