

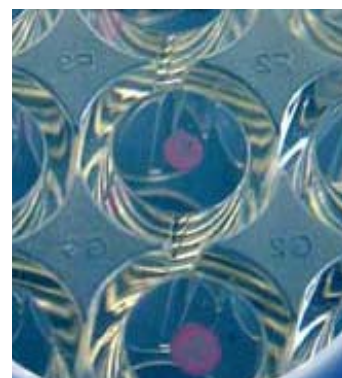
Oxygen Monitoring

Oxygen monitoring in microplates can be used for a variety of applications amongst others:

- Determination of Bacterial Growth
- Cell Proliferation
- Enzyme Screening
- Drug Screening

Monitoring of cell growth of mammalian or bacterial cells can be done by detecting the change of oxygen concentration. Screening of enzyme reactions can be shown by the respective oxygen consumptions.

One characteristic of compound screening in pharmaceutical development is the MIC (minimum inhibitory concentration). This concentration can be readily determined by measuring the dissolved oxygen concentration.



For oxygen monitoring in microplates the **OxoPlate® (PreSens)** can be used and measured with the BERTHOLD TECHNOLOGIES multimode reader Mithras LB 940.



The sensors are thin, hydrophilic, and almost calibration-free: Only 8 wells of the first plate have to be calibrated by an easy 2-point calibration. All other sensors of the same batch have the same calibration values. Thus, comparison of 96 different compounds without losing wells by using standards in every plate can be done.

The individual sensor spots are located at the bottom of the wells for quantification of dissolved oxygen in the physiological range.

Instrument settings

As OxoPlate® contains two different dyes the BERTHOLD TECHNOLOGIES microplate reader Mithras measures in **dual kinetic mode** using two different filter pairs:

Filter pair 1 = Intensity oxygen indicator: Excitation 540 nm/Emission 650 nm

Filter pair 2 = Intensity oxygen reference: Excitation 540 nm/Emission 590 nm

For a better well to well reproducibility intensity of indicator and intensity of reference are measured and the ratio is calculated.

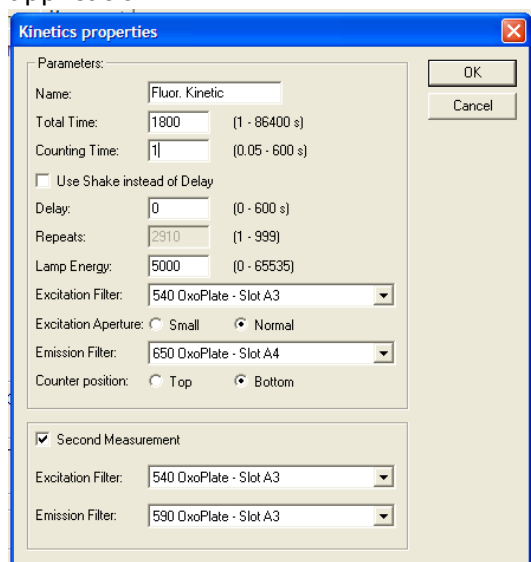
Filter order numbers:

Excitation 540nm: 39803

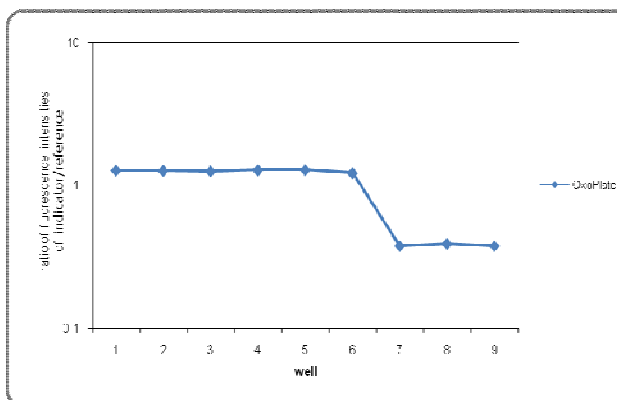
Emission 590nm: 37989

Emission 650nm: 40098

Picture 1 shows the fluorescence kinetic in bottom reading with dual filter measurement set in MikroWin software as it can be done with the Mithras LB 940 multimode reader. The total reading time can be selected according to the requirements of the performed application.



Picture 1: Dual kinetic mode in bottom reading with Mithras LB 940 and MikroWin software



Picture 2: Change of the fluorescence ratio indicator/reference of OxoPlate® measured with BERTHOLD Mithras LB 940 in top reading mode: well 1-5: 0% air saturation, well 6-7: 100 % air saturation

The change of fluorescence signal was measured with OxoPlate® in the Mithras LB 940. Fluorescence bottom reading mode is required as coloured, fluorescent or turbid ingredients of the sample will interfere with measurement from the top side. For transparent samples top reading mode can be selected.

Following settings in Mithras LB 940 were used (picture 2):

Lamp energy: 5000 Measurement time: 1 second Counter position: top
Excitation: 540nm Emission: 590nm and 650nm

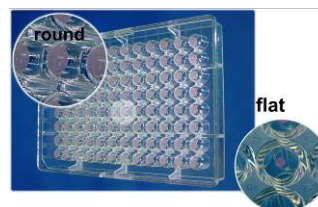
Picture 2 shows the change in the fluorescence intensity between samples with 0% and 100% air saturation. The wells were filled with water (100% air saturation) and sulphite solution (0% air saturation).

Microplates from PreSens - Precision Sensing GmbH

OxoPlate® with 96-well round bottom microplate: OP96U

OxoPlate® with 96-well flat bottom microplate: OP96C

more information: www.presens.de



BERTHOLD TECHNOLOGIES' instruments:

Mithras LB 940 Multimode Reader



With this abstract BERTHOLD TECHNOLOGIES likes to give a short introduction and some information about available kits. BERTHOLD TECHNOLOGIES will not be in no way responsible for the validity of information given on these pages.