



## Application Note AN-I-032

# Dissolved oxygen, conductivity, and pH value in liquid dairy products

## Fast and reliable single determination with the 914 pH/DO/Conductometer

In the food industry, it is essential to determine and monitor certain quality parameters to guarantee consistency. This is especially important for liquid dairy products, which are subject to a strict cold chain. Both the dissolved oxygen (DO) and the pH value have proven to be reliable quality criteria.

Oxygen shortens the shelf life and influences the product quality (e.g., nutritional value, color, and flavor). The DO content depends on the salinity in the sample, which is automatically calculated

and corrected by the 914 pH/DO/Conductometer during the parallel conductivity measurement.

Acidity is another important characteristic to measure in liquid dairy products. It can be checked easily using the pH value.

With the 914 pH/DO/Conductometer, all important quality criteria can be monitored with one device. Fast, safe, and reliable analysis for the food industry.

## SAMPLE AND SAMPLE PREPARATION

This application is demonstrated on raw milk (untreated and fresh), UHT skimmed milk with 0.1% fat, UHT milk with 1.5% fat, pasteurized milk with 3.5% fat, UHT coffee cream with 15%

fat, UHT full-fat cream with 35% fat, and whey drink.

No sample preparation is required.

## EXPERIMENTAL

The determinations are carried out with a 914 pH/DO/Conductometer equipped with an O<sub>2</sub>-Lumitrode, conductivity measuring cell, and an iUnitrode. All sensors are pre-calibrated with appropriate standards.

An appropriate amount of sample is poured carefully (to omit entrainment of oxygen) into the sample beaker equipped with a magnetic stir bar.

The sensors are placed directly into the sample. The measurement is started and the corresponding parameters are measured until a stable value is reached. Afterwards, the sensors are removed and cleaned with deionized water.



**Figure 1.** 914 pH/DO/Conductometer equipped with an O<sub>2</sub>-Lumitrode, conductivity measuring cell, and iUnitrode (missing in the picture) for the determination of DO, K (conductivity), and pH in liquid dairy products.

**Table 1.** Summarized results for DO, conductivity (K), and pH value in several liquid dairy products.

Sample (n = 6)	DO in mg/L	K in mS/cm	pH value
Raw milk	5.81	4.978	6.65
UHT milk	5.86	5.024	6.74
Skimmed milk	0.87	5.119	6.76
Past. milk	10.65	4.868	6.76
Coffee cream	7.74	4.856	6.94
Full-fat cream	0.47	2.530	6.86
Whey drink	8.87	6.406	4.24

## CONCLUSION

The 914 DO/pH/Conductometer is a fast, precise, and reliable all-in-one solution to determine the dissolved oxygen, conductivity, and pH value in liquid dairy products.

Accurate measurement of all listed parameters takes a few minutes. Thanks to the well-known

Metrohm quality, the O<sub>2</sub>-Lumitrode is completely maintenance-free while the Conductivity measuring cell and the iUnitrode are easy to use and robust for daily laboratory work.

Internal reference: AW ISE CH-0177-042021

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## CONFIGURATION



### 914 pH/DO/Conductometer

便携式双通道 pH/DO/率量,智能量入端,用于溶解的气/pH/mV/率行量/,模量入端,用于溶解固体/度和温度行量。

通池供且有支架板的量,便可以面向和在室中量的最佳装。

- 数字量入端,用于 O<sub>2</sub>-Lumitrode 和智能 pH
- 瑞士万通的 4 用模率量入端
- 内置池的室 pH/DO 和率量
- 同量 pH 和率
- 同量气和率
- 固耐用的防水防外 (IP67),合外及室使用
- 背光 LCD 彩色示屏,用于方便取果
- USB 接口,用于方便将数据从算机出到打印机上
- 更大的内存(10000 数据)
- 引保型用和家模式,防止了不必要的参数修改
- GLP 打印和数据出,用 ID 和戳



### O2-Lumitrode

用于量溶解 (DO) 的光学传感器可以和— 913 pH/DO Meter 或 914 pH/DO Conductometer 搭配使用。传感器的原理基于光抑制。省空并免的传感器用于以下程中的 DO 量:

- 水的量控制
- 水理工
- 料制造

传感器在交付的候有一个校正筒和 3 x 30 mL 准溶液 0%。

包含有气敏感的光体的量帽(O<sub>2</sub> 帽),可在需要松更。



### c = 0.5 cm<sup>-1</sup> Pt1000

池常数的 4 c = 0.5 cm<sup>-1</sup> (指数),集成有温度探 Pt1000 和固定,用于接到 912/914 量上。

得益于聚丙烯制成的固/不易破碎的塑料杆,传感器可以承受高的机械荷,并用于量中等的率(15 μS/cm 至 250 mS/cm),例如:

- 用水
- 地表水
- 水



### iUnitrode Pt1000

集成了传感器数据存芯片和 Pt1000 温度传感器的智能合 pH。特用于:

- 用于的、粘性或性品中的 pH 量和滴定
- 温度升高的候
- 量的候

固定磨口隔膜染不敏感。

参比解:c(KCl) = 3 mol/L,存在存溶液中。

替代方法:T>80° C 的量用参比解:Idrolyt,存在 Idrolyt 中。

iTrodes 可用于 Titrande,Ti-Touch 或 913/914 米。