



Application Note AN-I-031

Dissolved oxygen in acrylic dispersion paint

Fast and accurate determination using an optical sensor

Acrylic dispersion paints are made of pigment suspended in acrylic polymer emulsions. These emulsions also include other organic material such as plasticizers, defoamers, or stabilizers. Acrylic dispersion paints are water-soluble but become resistant to water when dry.

Acrylic dispersion paints should be stored air-tight at room temperature. As such, the paint can be stored for up to five years. Should it dry out, it can no longer

be used.

For research purposes, it is of interest to assess the dissolved oxygen (DO) concentration in such samples as it is assumed that the DO amount can be related to the storage life.

This Application Note describes a fast and accurate determination of dissolved oxygen by using an optical sensor.

SAMPLE AND SAMPLE PREPARATION

The method is demonstrated on an acrylic dispersion

paint. No sample preparation is required.

EXPERIMENTAL

This analysis is carried out with a 914 pH/DO/Conductometer equipped with an O₂-Lumitrode which is calibrated with 100% and 0% air saturation.

The sample is transferred into a beaker and the O₂-Lumitrode is placed directly into the sample. The measurement is started and the DO content is measured until a stable value is reached. Afterwards, the sensor is removed, adhering paint is wiped off with a tissue, and then the sensor is cleaned thoroughly in a beaker containing a detergent solution, while stirring. Finally, the sensor is rinsed with deionized water.



Figure 1. 914 pH/DO/Conductometer equipped with an O₂-Lumitrode for the determination of dissolved oxygen in acrylic dispersion paint.

RESULTS

For the analyses, stable results are obtained within just a few minutes. A mean value of 7.62 mg/L DO

was obtained for the analyzed dispersion paint with an absolute standard deviation of 0.12 mg/L (n = 4).

CONCLUSION

The dissolved oxygen content in acrylic dispersion paint can be assessed reliably and quickly using a 914 pH/DO/Conductometer equipped with the optical sensor O₂-Lumitrode. An accurate measurement takes

less than a few minutes, and the sensor is completely maintenance-free. No need to worry about the quality of your sensor: if the O₂ cap needs to be replaced, the instrument will tell you.

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