

Biological applications of photoLab® 7600 UV-VIS

Applied Product

- WTW Spectrophotometer photoLab® 7600 UV-VIS

Application Type

- Environmental inspection laboratory,
General biochemistry laboratory

Application Tasks

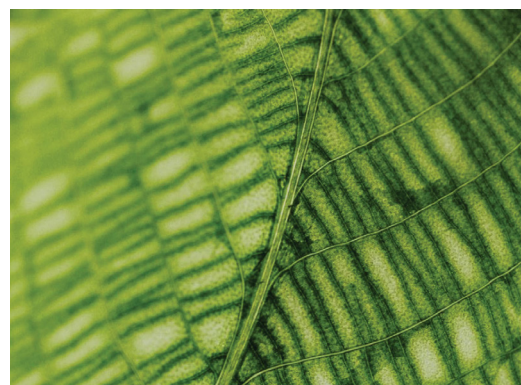
- Ammonia nitrogen detection.
- Detect the chlorophyll content "A" in water quality, due to legal requirements.
- Identify fish species using the DNA from the fish roe collected in the water that was amplified by PCR.

Successful Sales Experience

- The customer's requirement is to detect chlorophyll A and ammonia nitrogen in water. The detection of chlorophyll A requires simultaneous detection of multiple wavelengths (649 nm, 665 nm, 750 nm), so we recommend customer below items:

1. WTW photoLab® 7100 (Visible)

- In the process of communication, we learned that in addition to detecting chlorophyll A and ammonia nitrogen, they also need to detect DNA concentration. The customer will extract DNA from fish roe collected in water and use PCR amplification for gene sequence. The result will determine the type of fish species. This process requires UV light, as a result we recommended WTW photoLab® 7600 UV-VIS to the customer. Since the DNA concentration in a fish roe is very low and not suitable for dilution.
- Generally the normal volume of cuvette is too large to detect. We apply small volume cuvette which is narrowed down to 0.7 mL and successfully detect the concentration of DNA. This method raises the probability of successful PCR process.



Successful Application

- WTW photoLab® 7600 UV-VIS can meet the customer's needs of detecting multiple samples.

1. Ammonia Nitrogen

The instrument has a built-in ammonia nitrogen detection method. Just purchase the corresponding reagent and select the correct built-in method.

2. Chlorophyll A

Multi-wavelength detection can be set. The calculation formula can be customized. Therefore the concentration of chlorophyll A of the sample can be directly calculated without using excel.

Customized formula:

$$R = 13.7 * (A_{665nm} - A_{750nm}) - 5.76 * (A_{649nm} - A_{750nm}) * 10$$

3. DNA

Customized formula with a result value of DNA concentration.
 $dsDNA = 50 * (A_{260} - A_{310}) * \text{dilution multiple (ng/uL)}$

Value Created for the Customer

photoLab® 7600 UV-VIS provides customer with various sample detection at the same time. The ability of detecting DNA concentration of fish roe is unexpected and saves the expense of purchasing a micro volume spectrophotometer. Also, WTW provides various detection reagents for customers multiple applications.


Future Opportunity

Currently, customer's COD samples are mainly outsourced for testing. The customer considers purchasing WTW COD testing reagents for industrial wastewater and directly test the sample in the lab using photoLab® 7600 UV-VIS or applied the exclusive OptRF non reagent method for civil effluent of COD. This product can be used by universities' biochemical laboratories, industrial quality control laboratories, and environmental inspections labs.


[Learn more about the WTW 7600 UV-VIS Spectrophotometer](#)

Source: This case study was written by WTW distributor, SUNTEX.







www.suntex.com.tw



photoLab® 7600 UV-VIS Spectrophotometer



The future has arrived:
Optical reagent-free measurement of COD, nitrate and nitrite (OptRF)

-  Optical Reagent-free measurement technology (OptRF) for standard parameters COD, NO₃, NO₂ in the outlet of sewage plants.
-  Barcode support and automatic cuvette recognition.
-  Standard methods such as UVT, SAC, coloration or chlorophyll.
-  Multi-level AQA.
-  Wavelength Range: 190 - 1100 nm.
-  Kinetics - Chemical reaction rates.