

Pollutants analyzer
for fruits and
vegetables in water
(PestiEye 1)



Motivations

- When washing fruit and vegetables before cooking, it is often not known when to wash the extent that pesticide residues are acceptable.
- Therefore, it is necessary to provide a device that can help people check fruit and vegetables pesticide residues in water.
- At the same time, it's hoped that un-noticed turbidity in clear water can be shown.
- No need to do any processing of fruit and vegetables in advance.



Product Appearance

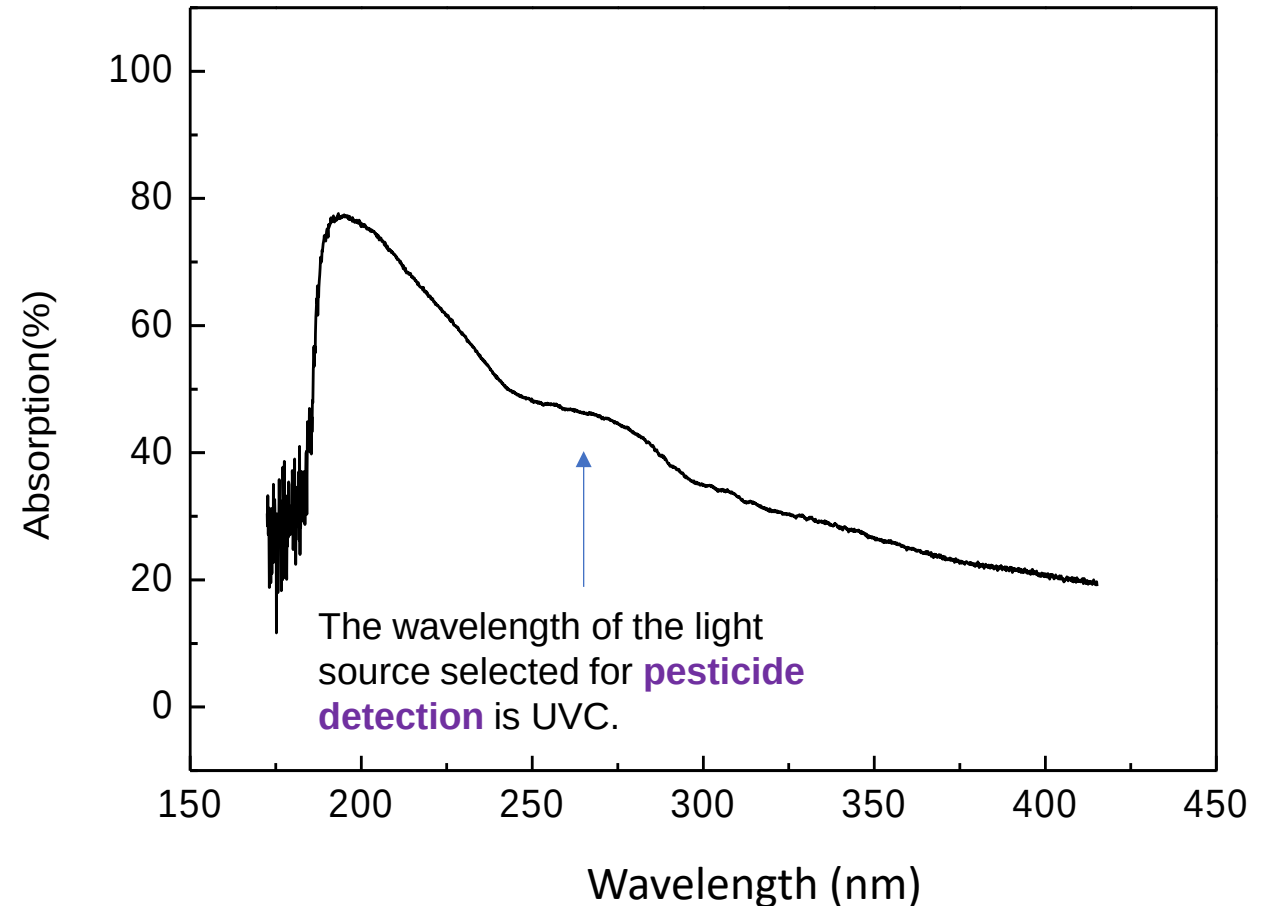
The part of the detection area needs to immerse into the water. The width of the slit is 2mm, which avoids the vegetable leaves or impurities from entering the optical zone and causes interference.



A designed hook is attached to the back, which can hang on the horizontal bar of the kitchen counter or a 3M small hook.



Spectral characteristics of mixed pesticides in vegetables and fruit washing water can be detected!



PestiEye technical principle

Use general spectral analysis to detect the pesticide absorption spectrum distribution, thereby process semiquantitative analysis of the pesticide in the water solution.

PestiEye technical advantages

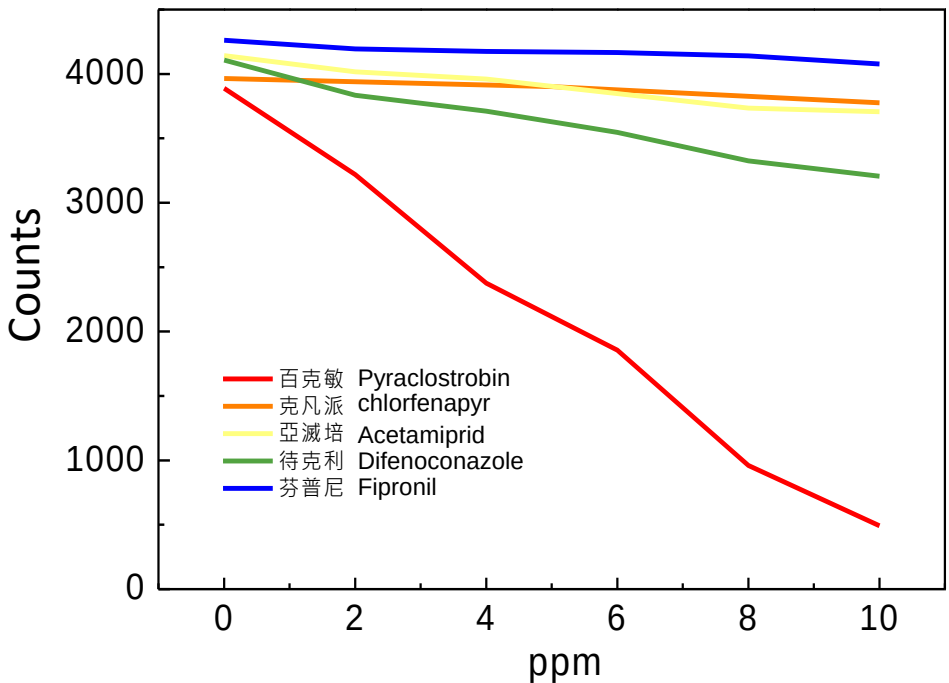
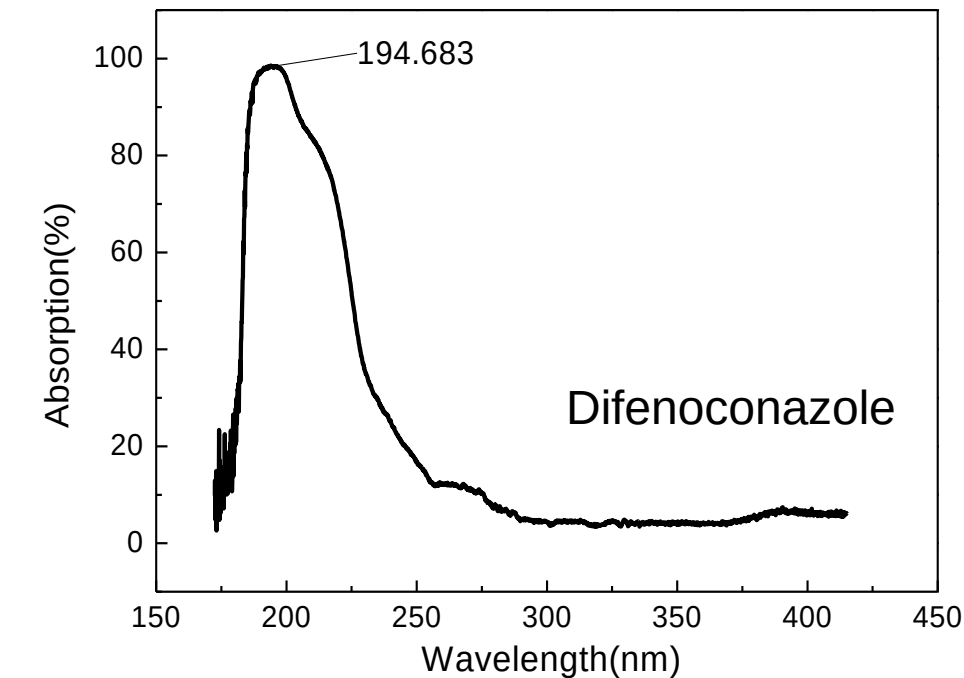
- Can detect pesticide residues and turbidity at the same time.
- UV dynamic algorithm meets the detection of flowing aqueous solution environment.
- Detection time <3 sec.
- Not affected by ambient light.

PestiEye technical limitation

Because the vegetables and fruit washing water contains mixed pesticides, the amount of pesticide residues are in the washing water. Therefore, PestiEye can only use semi-quantitative analysis of pesticide residues but cannot accurately quantify and distinguish pesticide types.

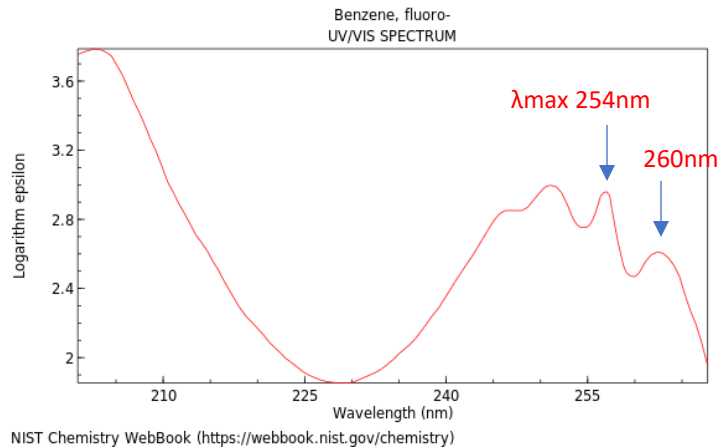
Range of detection limit

Take 2ppm of Difenoconazole as the reference, more than 2ppm is the detection of trace pesticides, and more than 4ppm is the excessive pesticides. This concentration is the definition of the concentration of multi-pesticides in water when fruit and vegetables are washing.

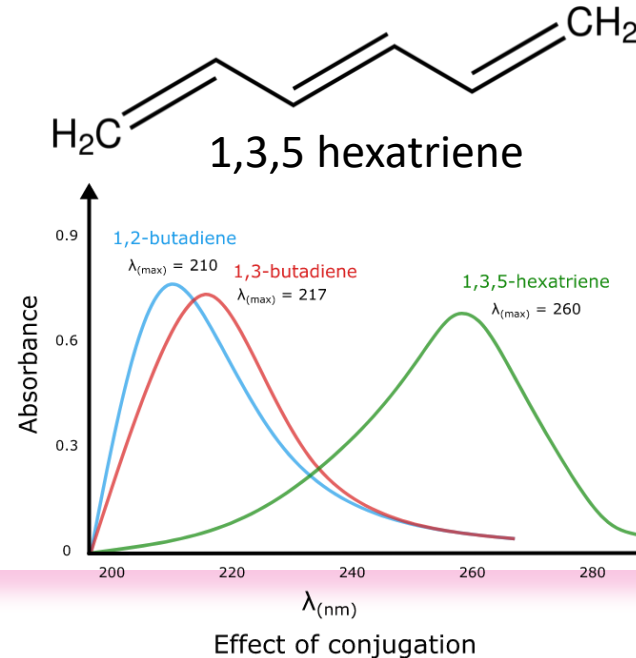


Optical Principle (Organic pollutants/Microorganism)

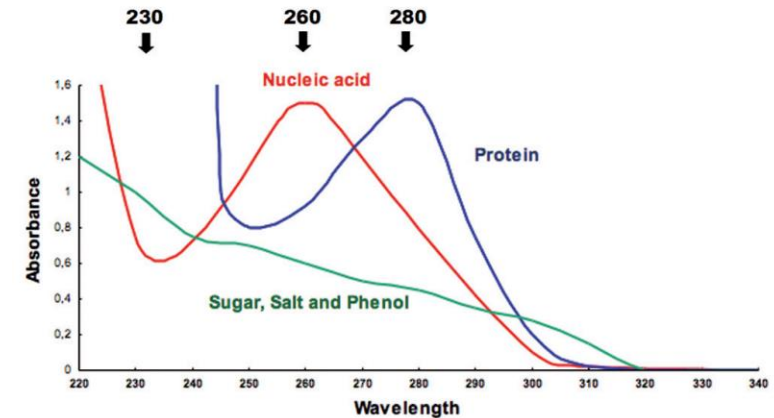
Benzene ring: using OD260 to check the absorption of benzene ring to infer the pollutant level.



Conjugated double bonds: 1,3,5 hexatriene has 258nm absorption. Higher numbers of conjugated double bonds, or they connect with more benzene rings induce higher OD260 absorption.

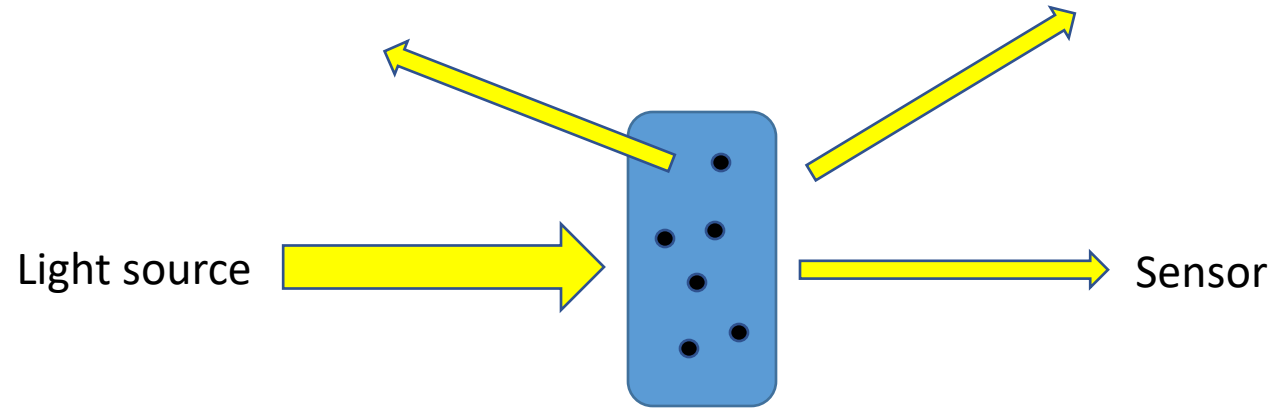


Microorganism: Inspection of DNA/RNA/Protein usually relates to 230/260/280nm. OD260 absorptive inspection is performed to check the pollutant level of microorganism.



Optical principle (Turbidity)

Turbidity: OD365 inspection is performed to sense the scattering condition which can be inferred the pollutant level of particles, cluster, or colony of microorganism.



PestiEye photoelectric pesticide residues detection

Features:

- No need to damage fruits and vegetables (detect washing water ONLY!)
- Hanging on the edge of basin
- No need to use chemical reagent or strip
- Reaction time < 3 sec
- Immediately shows the state of washing fruits and vegetables (red, orange, or green light)
- Handy design and easy to use.
- Auto-calibration in air before use
- Dynamic optical algorithm for flowing water



PestiEye Spec

Product name	Optical analyzer of pollutants in water solution using UV radiation
Model name	PestiEye 1
Results (LCD)	Green light: <2 ppm Orange light: 2-4 ppm Red light: >4 ppm
Methodology	Spectrophotometry
Power supply	Li polymer battery (1500mAh)
Light source	UV LED (260/365nm)
Display	TFT-LCD
Waterproof	IPX7 (front-end probe head)
Environment of using	+ 10 ~ + 40°C 、 30 ~ 85% RH
Environment of storage	- 20 ~ + 60°C 、 10 ~ 95% RH

Inspection results shown



Normal



Low-level pollution



High-level pollution



Slightly turbid



Highly turbid or high-level pollution, changing water suggested

Technology summary

- UV spectral analysis
- Use of UV light source and UV sensors to check the absorbance of liquid within the pathlength of light
- Particles in liquid scatter the light. So, the device shows the icon of turbidity.
- PestiEye checks the spectrum of pesticide dissolved in clear water. If the water contains the color of fruit juice or vegetables, detection of pesticide will be interfered, and device shows the icon of turbidity.

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