

Freshness Meter

KV-202

Patents Pending: JAPAN, U.S.A., CANADA,
GERMANY, FRANCE,
ENGLAND, ITALY



Rapid measurement of "K value," the decisive factor in freshness, is now possible. Reliable instrumentation is also available, eliminating virtually all dependence on skill or experience.

Features

1. Can measure freshness of frozen goods.
2. Does not require special technology and measurement can be made simply.
3. Built-in micro processor provides automatic calculations, display and filing data.
4. Only a short time of 5 to 6 minutes is required for evaluation.
5. Calibration using a standard solution is unnecessary.
6. Measurement is not affected by contaminated or colored samples.

What is the K value?

After the death of a fish, the ATP contained in its muscles is decomposed sequentially by the action of enzymes which originally exist in fish muscle, as shown in formula (1).

The K value is a percentage of decomposition products (HxR + Hx) to the total ATP-related compounds as shown in formula (2), which accurately reflects empirically observable changes in the freshness degree and is recognized at present as the most appropriate index of freshness.



$$\text{K value} = \frac{\text{HxR} + \text{Hx}}{\text{ATP} + \text{ADP} + \text{AMP} + \text{IMP} + \text{HxR} + \text{Hx}} \times 100 (\%) \dots (2)$$

ATP: Adenosine triphosphate
AMP: Adenosine monophosphate
HxR: Inosine
ADP: Adenosine diphosphate
IMP: Inosinic acid (inosine 5', phosphate)
Hx: Hypoxanthine

Specifications

■ Main Body

Oxygen electrode: Polarographic membrane covered oxygen electrode

Power source: AC 100V, 50/60 Hz

Dimensions: 260(W) x 174(D) x 148(H)mm

Weight: Approx. 2.7 Kg

■ Printer

Power source: DC 6V

Dimensions: 100(W) x 150(D) x 60(H)mm

Weight: Approx. 380 g

■ Preliminary Reaction Tank

Scope of

temperatures: 0 to 100°C

Power Source: AC 100V, 50/60 Hz, 11A

Dimensions: 130(W) x 130(D) x 300(H)mm

Weight: Approx. 4.7 Kg

■ Standard Accessories

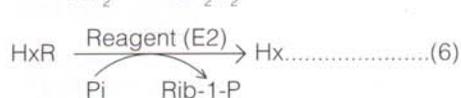
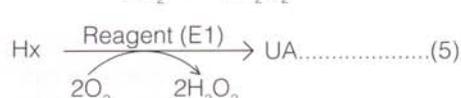
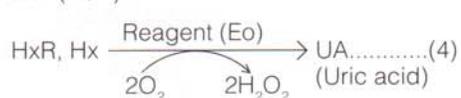
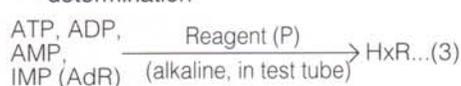
Measuring reagent kit (K1)	1
Extracting reagent kit	1
Micro-syringes, 25, 50 and 100μl	1ea.
Air pump	1
Silicon tube	2
Beaker (20ml)	1
BOD bottle	2
Test tube (φ10mm)	50
Poly-pipette	2
Stirrer bar	1
Electrolyte	1
Electrode membrane	10
O-ring	2 sets
Polisher	1

Major Uses

- Fresh meat – freshness control of fish, chicken, pork, beef, etc.
- Processed food – quality control of manufacturing materials and quality evaluation of canned food.
- Electric and mechanical fields – performance evaluation of refrigerators, freezers and thawing machines.
- Research and education – development of preservation technology, study of cooking science, and as an educational tool.

Principle

(1) Basic enzymatic reaction for determination



Pi: inorganic P

Rib-1-P: Ribose-1-phosphate

(2) Method of determination

1. The oxygen consumed as shown in equations (4) and (5) is measured by a Clark oxygen electrode, attached to the reaction cell.
2. Two moles of oxygen are consumed: one mole for each component. Therefore, each component can be determined through a dissolved oxygen $[D_0]$ depression measurement.
3. Reagent E0 is used for determining the K and K_1 value. Shown as (2).
1st step reaction: for determination of HxR + Hx (corresponds to depression, D_1).
2nd step reaction: for determination of the overall component (corresponds to D_2).
4. Reagents E_1, E_2 are used for determining Hx and HxR respectively, as shown in equation (5) and (6).

Example by the Electrode Method

