

JIS

JAPANESE INDUSTRIAL STANDARD

**Glucose Isomerase for
Industrial Use**

JIS K 7002—1988

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by

Japanese Standards Association

In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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Glucose Isomerase for Industrial Use

K 7002-1988

1. Scope

This Japanese Industrial Standard specifies glucose isomerase for industrial use, hereinafter referred to as glucose isomerase.

2. Definitions

For the purpose of this Standard following definitions apply:

- (1) isomerization rate The weight rate of fructose to the sum of dextrose in reaction liquid and fructose.
- (2) maximum activity Immobilized enzyme is filled in a reaction tower, and after the liquid pass operation is begun at the definite condition, the enzyme activity when the maximum flow speed is obtained.
- (3) initial activity The enzyme activity extrapolated to liquid pass beginning time (0 time) by using logarithmic regression formula between the enzyme activity and liquid pass time.
- (4) activity half-life Under the definite conditions to obtain 45 % of isomerization rate, the time until the residual activity becomes $\frac{1}{2}$ of initial activity.
- (5) productivity The product isomerized by enzyme 1 kg (converted to isomerization rate 45 %), expressed by dry mass (kg).

3. Classification

The classification of glucose isomerase shall be as follows:

3.1 Liquid Products The products refined of enzyme obtained from inside and outside of microorganism fungi, having liquid state.

3.2 Immobilized Products

- (1) The product of immobilized microorganism fungi or enzyme by using adhesive agent.
- (2) The product of immobilized microorganism fungi or enzyme by using covering agent.
- (3) The product of immobilized microorganism fungi or enzyme by using carrier.
- (4) The product of immobilized microorganism fungi or enzyme by using two or three kinds out of adhesive agent, covering agent or carrier.

4. Quality

The quality of glucose isomerase shall be as given in Table.

Applicable Standards: See page 8.

Table. Quality of Glucose Isomerase

Quality	Liquid product	Immobilized product
Activity (U/ml)	Marked value min.	—
Maximum activity (U/g)	—	Marked value min.
Activity half-life (h)	—	Marked value min.
Productivity	—	Subject to agreement between the parties concerned.

5. General Conditions for Test

5.1 Reagent The reagent of the most high grade complying with the Japanese Industrial Standard shall be used. In case where there is no reagent designated as JIS mark allowable article, the most high grade reagent certified based on the reagent marking certification system of Ministry of International Trade and Industry shall be used.

Further, where there is no marked article with JIS mark, nor reagent certified based on the reagent marking certification system, the reagent having no interference to test shall be used.

5.2 Glass Apparatuses For glass apparatuses, those specified in JIS R 3503 and JIS R 3505 shall, as a rule, be used.

5.3 Water Distilled water or ion-exchanged water not more than 5 $\mu\text{S}/\text{cm}$ in electric conductivity shall be used.

6. Test Methods

6.1 Activity

6.1.1 Reagents and Devices

- (1) **Test Tube** The test tube of 25 mm in outer diameter, 200 mm in length, having round bottom and attached with the marked line at the position of 50 ml in volume. However, the test tube to be used for coloration, shall have no marked line.
- (2) **Constant Temperature Water Tank** The water tank attached with a stirrer and capable of holding at $60 \pm 0.5^\circ \text{C}$.
- (3) **Dextrose Solution (0.2 mol/l)** Weigh out dextrose anhydrous specified in JIS K 8824 1.8 g which is dried at 65°C , at reduced pressure for 5 hours and allowed to stand cool in a desiccator, put into a transfer flask of 50 ml, add phosphate buffer solution (0.2 mol/l) (pH 7.2) 25 ml and magnesium sulphate solution (0.1 mol/l) 5 ml to dissolve, and add phosphate buffer solution (0.2 mol/l) up to the marked line (1).
- (4) **Enzyme Solution for Test** Take enzyme solution 1 ml or 1 g, put it into a transfer flask of 100 ml, and add phosphate buffer solution (0.02 mol/l) up to the marked line.

Take a definite amount of this solution by using a transfer pipette, put it into the transfer flask, add phosphate buffer solution (0.02 mol/l) up to the marked line and allow it to be enzyme solution for test.