



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 5413.29-2010

**National food safety standard Determination of solubility in
foods for infants and young children, milk and milk products**

婴幼儿食品和乳品溶解性的测定

(English Translation)

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Foreword

The Standard specifies two methods. The first method is insolubility index method; it is identical to

IDF129A:1988 Dried Milk and Dried Milk Products - Determination of Insolubility Index issued

by the International Dairy Federation. The second method is solubility method.

This standard replaces GB/T 5413.29-1997 Milk Power and Formula Foods for Infant and Young

Children - Determination of Solubility.

The previous editions replaced by this Standard are as follows:

- GB 5413-1985 and GB/T 5413.29-1997.

National Food Safety Standard

Determination of Solubility in Foods for Infants and Young Children,

Milk and Milk Products

1 Scope

This Standard specifies the determination methods of insolubility index and solubility. The first method of this Standard is applicable to determination of insolubility index of milk powder without soybean ingredients. The second method is applicable to determination of solubility in foods for infants and young children, and milk powder products.

Method 1 Determination of Insolubility Index

2 Terms and Definitions

Insolubility index

It refers to the volume of precipitate in mL obtained after recovery and centrifugation of milk powder or milk powder products, under the conditions specified in this Standard.

3 Principle

Add the sample to 24 °C or 50 °C water. Then recover it with a special stirrer. Stand for some time (as specified). Centrifuge the recovered milk of a certain volume in a graduated centrifugation tube. Remove the supernatant. Add the water with the same recovery temperature, so as to suspend the precipitate again. Centrifuge the sample again. Record the volume of the obtained precipitate.

Note: Water of 24 °C shall be used when spraying and drying the product recovery. Water of 50 °C shall be used when using partial drum to dry the product recovery.

4 Reagents and materials

Unless otherwise specified, all reagents used in this method are analytical reagents. The water is Grade III!Unexpected End of Formula!Unexpected End of Formula stipulated in GB/T 6682.

4.1 Silicone defoaming agent: Mass fraction of silicone emulsion is 30 %.

The applicability of the silicone defoaming agent shall be tested according to the procedures mentioned in 6.4.5 (without adding sample). After the test, the visible silicone liquid at the bottom of the centrifugation tube shall not exceed 0.01 mL.

6.4.5 Add 3 drops of silicone defoaming agent to the mixture in the cup. Mix the contents in the

cup with the flat spoon (5.10) for 10 s (no excess). Then pour the mixture in the centrifugation tube (5.12) to the scale of 50 mL. That is, the level of the top is consistent with the scale mark of 50 mL.

6.4.6 Place the centrifugation tube in the centrifuge (symmetrically). Make the centrifuge to

rotate quickly and produce an acceleration of 160 gn at the bottom of the tube. Then rotate at a temperature of 20 °C - 25 °C for 5 min.

6.4.7 Take out the centrifugation tube. Remove and pour down the upper fatty substance in the

tube with the flat spoon (5.10). Hold the centrifugation tube vertically. Remove the supernatant with the siphon or suction tube (5.13). For the drum dried product, suck until the top of the liquid coincides with the 15 mL marking-line. If it is the spray dried milk powder, suck until the top of the liquid coincides with the 10 mL marking-line. Pay attention not to stir the insolubles. If the volume of the precipitate exceeds 15 mL or 10 mL obviously, do not perform the lower-part operation. Record the insolubility index as "15 mL" or "> 10 mL". Mark the recovery temperature as described in Chapter 7; otherwise operate according to 6.4.8.

6.4.8 Add 24 °C or 50 °C water to the centrifugation tube till the level reaches 30 mL. Fully stir

the precipitate with the stirring rod (5.14). Put the stirring rod against the tube wall. Add some water of the same temperature. Flush the liquid on the stirring rod down, till the liquid-level coincides with 50 mL marking-line.

5 times slowly. Mix the contents thoroughly. Remove the stopper (place the bottom of the

stopper against edge of the centrifugation tube, so as to collect the liquid attached).

Centrifuge at the specified rotating speed and temperature for 5 min as described in 6.4.6.

Note: It is recommended that the centrifugation tube to be placed in the centrifuge, so as to make the

direction of the scale mark on the centrifugation tube to be consistent with the rotation direction of the

centrifuge. In such way, the volume of the precipitate could be easily estimated even if the top of the

precipitate inclines.

6.4.10 Take out the centrifugation tube. Hold it vertically. Use appropriate background for

contrast (see note). Make the eyes in the same level with the top of the precipitate. Read the volume of the precipitate with the help of the magnifier (5.15). If the volume of the precipitate is less than 0.5 mL, it shall be accurate to 0.05 mL. If the volume of the precipitate is more than 0.5 mL, it shall be accurate to 0.1 mL. If the top of the precipitate inclines, its volume shall be estimated. If the top of the precipitate is uneven, the centrifugation tube shall be vertically placed for a few minutes. Usually, the top of the precipitate will become flatter, so the number will be easier to read. Record the temperature of recovered water.

Note: Observe the centrifugation tube with light or dark background for contrast. The top of the precipitate will be more striking and easier to read.

7 Expression of analytical results

The insolubility index of the sample is equal to the volume of the precipitate in mL recorded in 6.4.10. The temperature of the water used during the recovery shall be reported at the same time. For example: