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PRINCIPLE OF THE ANALYSIS

The concentration of a solution is related to its refractive index and hence a measurement of refractive index can be used to measure concentration. The refractive index of blood serum or plasma depends mainly upon its protein concentration, as proteins are one of the major constituents.

This instrument has been designed to use the refractive index method for measuring total protein in serum. The protein scale has been prepared after extensive clinical analyses undertaken by Dr. Matsumura, Professor of Biochemistry at the Tokyo Women's Medical College. His scale is based on the results obtained from over 1400 cases. The scale is the most reliable one at present available.

Features

1. Measurements can be made with a few drops of the sample.
2. No special training or knowledge is required.
3. Accurate determinations can be obtained within a few seconds.
4. The refractive index scale makes it possible to measure the concentration of other solutions.
5. Its pocket size makes it very handy to carry anywhere.

Scale adjustment

- (1) Before measuring the serum protein concentration, the instrument should be checked as follows.
- (2) Raise the daylight plate and place a few drops of distilled water on the face of the prism. Close the cover plate gently.
- (5) Bring the scale into focus by turning the eyepiece. If the boundary line does not coincide with the (water) line, or 1.333 line, make an adjustment by rotating the scale adjusting screw by screw driver.

REFERENCE NOTES

Hold the refractometer between the thumb and four fingers of the left hand and use the right hand for adjusting the eyepiece and manipulating the sample. Do not hold the refractometer by enveloping the entire tube with the palm of the left hand.

PRECAUTIONS

1. Since the refractometer is an optical instrument, do not drop it or handle it roughly.
2. Since the prism has a relatively soft surface, be careful not to scratch it.
3. After use, clean the prism surface and daylight plate with a soft cloth soaked in water and wipe off the moisture with a dry cloth.
4. If the prism surface is smeared with oil or similar liquids, it will repel the sample and obstruct the measurement. Wipe off the oil smear or contaminant with alcohol.

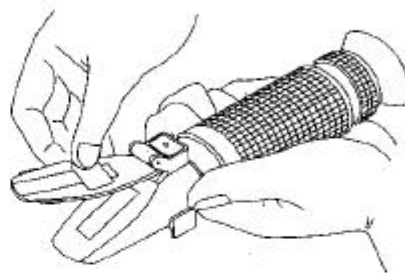
SPECIFICATION

Range of serum protein scale	: 0~12g/100ml
Precision for serum protein	: 0.2g/100ml
Range of refractive index scale	: nD 1.333~1.360
Size	: 4×4×18cm
Weight	: 170g

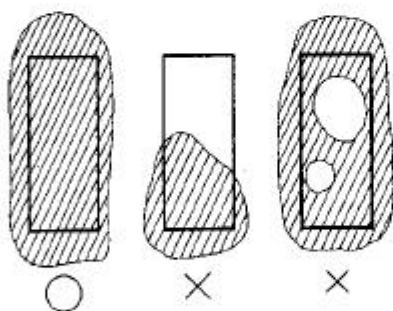
●MEASURING METHOD●



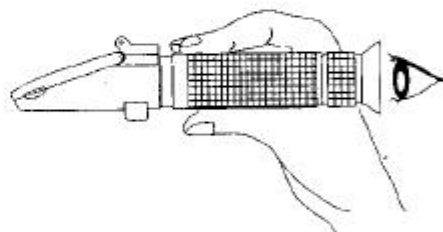
1 Put one or two drops of sample on the prism.



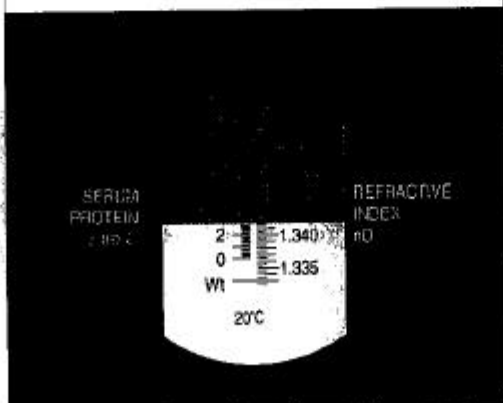
2 Close the daylight plate gently.



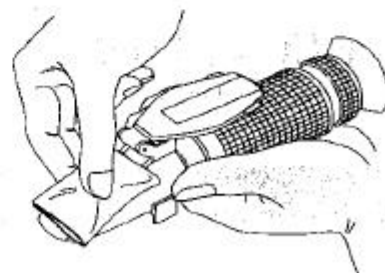
3 The sample must spread all over the prism surface.



4 Look at the scale through the eyepiece.



5 Read the scale where the boundary line intercepts it.



6 Wipe clean the sample from the prism with a tissue paper and water.

TABLE : Refractive index of aqueous solutions.

The refractive index table on the right hand side is given as examples. We recommend users to make their own tables according to their particular requirements or to use the tables given in reference books.

Solution	Concentration of solution (%)					Concentration of solution (%)			
	1	4	10	20		1	4	10	20
H ₂ SO ₄	1.3343	1.3378	1.3444	1.3549	KBr	1.3342	1.3377	1.3446	1.3556
HNO ₃	1.3343	1.3379	1.3451	1.3571	KI	1.3343	1.3382	1.3459	1.3585
H ₃ PO ₄	1.3340	1.3367	1.3418	1.3501	KNO ₃	1.3339	1.3367	1.3419	1.3500
NaCl	1.3348	1.3398	1.3494	1.3642	CuSO ₄	1.3348	1.3402	1.3503	1.3661
NaBr	1.3344	1.3385	1.3465	1.3593	ZnSO ₄	1.3348	1.3399	1.3496	1.3645
NaI	1.3344	1.3387	1.3473	1.3615	MgSO ₄	1.3350	1.3408	1.3514	1.3671
NaNO ₃	1.3341	1.3374	1.3437	1.3532	CaCl	1.3354	1.3423	1.3557	—
KCl	1.3344	1.3382	1.3457	1.3575	BaCl ₂ ·2H ₂ O	1.3343	1.3380	1.3453	1.3571

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