

Liquid Reagents – ready to use

UIBC (Unsaturated Iron Binding Capacity)

Ferene, with ATCS*

2 Reagents

Diagnostic reagent for quantitative in vitro determination of unsaturated iron binding capacity (UIBC) in human serum or plasma on photometric systems

REF	Cont.		
D07330	5 x 50 ml	4 x 50 ml 1 x 50 ml	Reagent 1 Reagent 2
D07340	5 x 25 ml	4 x 25 ml 1 x 25 ml	Reagent 1 Reagent 2
Additionally offered:			
D09035SV	1 x 1 ml	UIBC Calibrator	
D98481	12 x 5 ml	Control normal	Diacon N

TEST PARAMETERS

Method: Colorimetric, Endpoint, Decreasing Reaction, Ferene

Wavelength: 600 - 620 nm, Hg 578 nm, 623 nm

Temperature: 37°C

Sample: Serum, heparin plasma

Linearity: up to 750 µg/dl (135 µmol/L)

Sensitivity: The lower limit of detection is 6 µg/dl (1 µmol/L)

* Advanced Turbidity Clearing System; minimizes turbidity caused by lipemia

REAGENT COMPOSITION

COMPONENTS	CONCENTRATION
Reagent 1:	
Buffer, pH 8.7	100 mmol/l
Ammonium iron (II) sulfate	13 µmol/L
Thiourea	120 mmol/L
Reagent 2:	
Ascorbic Acid	240 mmol/L
Ferene	6 mmol/L
Thiourea	125 mmol/L

REAGENT PREPARATION

Substrate Start:
Reagents are ready to use.

Sample Start:
not possible.

REAGENT STABILITY AND STORAGE

Conditions: protect from light (R2)
close immediately after use
do not freeze the reagents!

Storage: at 2 – 8 °C
Stability: up to the expiration date

SAMPLE STABILITY AND STORAGE [3]

Separate serum/plasma at the latest 2 h after blood collection to avoid hemolysis.

Stability:: at 20 – 25°C 4 months
at 4 – 8°C 8 months
at -20°C 6 months

Discard contaminated specimens.

INTERFERING SUBSTANCES

no interference up to:

ascorbate	30 mg/dl
bilirubin	60 mg/dl
hemoglobin	200 mg/dl
triglyceride	2000 mg/dl
RF	350 IU/ml
copper	15 mg/dl
zinc	15 mg/dl

Strong hemolysis interferes as destroyed erythrocytes release iron.

MANUAL TEST PROCEDURE

Bring reagents and samples to room temperature.

Substrate Start

Pipette into test tubes	Blank	Cal.	Sample
Sample	-	-	75 µl
Std./Cal.	-	75 µl	-
Dist. Water	75 µl	-	-
Reagent 1	1000 µl	1000 µl	1000 µl
Mix, read absorbance A1 after 5 min. Then add:			
Reagent 2	250 µl	250 µl	250 µl
Mix, read absorbance A2 after exactly 5 min.			
$\Delta A = [(A2 - 0.81 A1) \text{ sample or cal.}] - [(A2 - 0.81 A1) \text{ blank}]$			

The factor 0.81 compensates the decrease of the absorbance by addition of reagent 2. The factor is calculated as follows: (sample + R1) / total volume.

CALCULATION (light path 1 cm)

$$\text{UIBC } [\mu\text{g/dl}] = \frac{\Delta A \text{ Sample}}{\Delta A \text{ Std/Cal}} \times \text{Conc. of Std/Cal } [\mu\text{g/dl}]$$

$$\text{TIBC } (\mu\text{g/dl}) = \text{UIBC } [\mu\text{g/dl}] + \text{Iron } [\mu\text{g/dl}]$$

$$\text{Transferrin } [\text{mg/dl}] = 0.7 \times \text{TIBC } (\mu\text{g/dl})$$

UNIT CONVERSION

$$\mu\text{g/dl} \times 0.1791 = \mu\text{mol/L}$$

REFERENCE RANGE [4,5] *

Taking into account reference values for iron and transferrin the following reference range results for UIBC:

120 – 470 µg/dl (21 – 84 µmol/L)

* It is recommended that each laboratory establishes its own normal range.

TEST PRINCIPLE

A known ferrous ion concentration incubated with serum binds specifically with transferrin at unsaturated iron binding sites.

Remaining unbound ferrous ions are measured with the ferene reaction. The difference between the amount of excess iron and the total amount added to the serum is equivalent to the quantity bound to transferrin. This is the UIBC of the sample.

Fe^{2+} (known) + Transferrin \rightarrow Transferrin(Fe^{2+}) + Fe^2 (excess)

Fe^{2+} (excess) + 3 Ferene \rightarrow Ferrous Ferene (blue complex)

PERFORMANCE CHARACTERISTICS

LINEARITY

The test has been developed to determine UIBC within a measuring range of 6 - 750 $\mu\text{g}/\text{dl}$ (1 - 155 $\mu\text{mol}/\text{L}$). A sample with a UIBC level exceeding the upper limit should be diluted 1+ 2 with 0.9% NaCl solution (9 g/L) and the result multiplied by 3.

PRECISION

Intra-assay n = 20	Mean [$\mu\text{g}/\text{dl}$]	SD [$\mu\text{g}/\text{dl}$]	CV [%]
Sample 1	65.8	1.27	1.93
Sample 2	264	3.62	1.37
Sample 3	531	8.73	1.64

Inter-assay n = 20	Mean [$\mu\text{g}/\text{dl}$]	SD [$\mu\text{g}/\text{dl}$]	CV [%]
Sample 1	170	4.43	2.61
Sample 2	263	3.61	1.37
Sample 2	475	6.31	1.33

METHOD COMPARISON

A comparison between Dialab UIBC Ferene (y) and a Values calculated from transferrin and iron measurement (x) using 100 samples gave following results:

$y = 0.96 x - 1.93 \mu\text{g}/\text{dl}$; $r = 0.976$.

QUALITY CONTROL

All control sera with Iron values determined by this method can be used.

We recommend:

REF

Cont.

D98481 12 x 5 ml **DIACON N** Assayed Control Serum Normal

CALIBRATION

The assay requires the use of an UIBC calibrator.

We recommend:

REF

Cont.

D09035SV 1 x 1 ml **UIBC Calibrator**

AUTOMATION

Special adaptations for automated analyzers can be made on request.

WARNINGS AND PRECAUTIONS

1. Use only disposable material to avoid iron contamination. Rinse glass material with diluted HCl and copious water.
2. Reagent 1 contains sodium azide (0.95 g/l) as preservative. Do not swallow! Avoid contact with skin and mucous membranes!
3. Take the necessary precautions for the use of laboratory reagents.

WASTE MANAGEMENT

Please refer to local legal requirements.

REFERENCES

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4. Dati F, Schumann G, Thomas L, Aguzzi F, Bauder S, Bienvenu J et al. Consensus of a group of professional societies and diagnostic companies on guidelines for interim reference ranges for 14 proteins in serum based on the standardization against the IFCC/BCR/CAP reference material (CRM 470). Eur J Clin Chem Clin Biochem 1996; 34:517-20.
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2°C

8°C

IVD



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