IODIDE IN URINE

Colorimetric determination of iodide in urine

CLINICAL MEANING

The iodine is introduced into the body through drugs, disinfectants, dyes, food and drink. Once converted to iodide is used for the synthesis of thyroid hormones.
Over 90% of the iodine is eliminated in the urine as iodide.
The knowledge of the value of iodide is essential for a correct evaluation of thyroid function.

TEST SUMMARY

The iodate catalyzes the reduction of tetravalent cerium ion (yellow) in cerium trivalent (colourless) by the arsenic ion in acidic media. The reduction of colour for unit time is proportional to the concentration of iodide in the sample.
The specimen must be treated in advance to eliminate interfering substances.

SAMPLES

Urine. Stability: 72 hours at 2-8°C.

REAGENTS

Diluent for samples: ammonium persulfate.

Reagent 1: arsenious acid, sulfuric acid.

Reagent 2: Cerium ammonium sulfate, sulfuric acid.

Standard: iodate ion at different concentrations of iodine; stabilizers and preservatives.

MATERIAL REQUIRED BUT NOT SUPPLIED

Normal laboratory equipment. Spectrophotometer UV/VIS with thermostatation. Automatic Micropipette. Cuvette in optical glass or monouse in optical polystyrene. Physiological solution. Glass tubes with screw cap or polyethylene tubes with screw cap.

PRECAUTIONS

Reagent may contain not reactive and conservative components. It is opportune to avoid contacts with the skin and do not swallow. Perform the test according to the general "Good Laboratory Practice" (GLP) guidelines.

REAGENTS PREPARATION

Prepare the Diluent for sample dissolving a vial with distilled water:
50 ml – Kit 50 tests CODE CC02800
20 ml – Kit 20 tests CODE CC02800/K
The liquid Diluent for sample is stable for 6 months stored at 2-8 ° C.
Reagents are ready to use and are stable until expiration date on label, stored at 2-8°C.

SAMPLES PREPARATION

Pipette 1 ml of Sample Diluent in a glass tube with screw cap or a polyethylene tube.
Add 250 µl of urine sample and put for 45 minutes in a dry bath at 95 ° C or in boiling water bath.
Cool the tubes with flowing water to room temperature.
Carry out the same treatment with standards.

PROCEDURE (STARTER REAGENT)

Kind of analysis:	fixed time
Reading time:	1-10 minutes
Wavelength:	405 nm (400-415)
Temperature:	20-25°C.
Lightpath	1 cm
Zero:	Blank Reagent

Reagents	Blank	Standard	Sample
Standard 0	300µl	--	--
Standard 50 µg/l	--	300µl	--
Standard 100 µg/l	--	300µl	--
Standard 150 µg/l	--	300µl	--
Standard 200 µg/l	--	300µl	--
Sample	--	--	300µl
Reagent 1	1,5 ml	1,5 ml	1,5 ml
Reagent 2	200µl	200µl	200µl
Read the absorbance after 1 minute and 10 minutes against the blank			

PROCEDURE (STARTER SAMPLE)

ATTENTION: follow this procedure only if you are using multi-cells instrument, that allow simultaneous reading of Sample cuvettes and Standard cuvettes.

Prepare the working reagent just before to effect the analysis, mixing 15 ml of Reagent 1 with 2 ml of Reagent 2 (keeping the ratio between two reagents, the volume can be changed based on your needs)

Reagents	Blank	Standard	Sample
Work Reagent	1,7 ml	1,7 ml	1,7 ml
Standard 0	300µl	--	--
Standard 50 µg/l	--	300µl	--
Standard 100 µg/l	--	300µl	--
Standard 150 µg/l	--	300µl	--
Standard 200 µg/l	--	300µl	--
Sample	--	--	300µl
Read the absorbance after 1 minute and 10 minutes against the blank			

CALCULATION

Calculate the differences between the readings taken after one minute and those carried out in the tenth minute (the reaction leads to a decrease of the colour).
Copy the values on graph paper and extrapolate the concentrations of the samples
The method should give a straight line through the origin if this occurs it is possible to calculate the concentration of the samples using the following formula:

Iodide µg/l = (ΔA sample/ΔA standard) x Stand. Value

EXPECTED VALUES

SEVERE DEFICIENCY	0 - 19 µg/l
MODERATE DEFICIENCY	20 - 49 µg/l
MEDIA DEFICIENCY	50 - 99 µg/l
OPTIMAL NUTRITIONAL VALUE	100 - 199 µg/l
ADEQUATE NUTRITIONAL VALUE	200 - 299 µg/l
EXCESSIVE NUTRITIONAL VALUE	> 300 µg/l

Every laboratory should establish own reference intervals in accordance with own population.

NOTE

- If the results are incompatible with clinical presentation, they have to be evaluated within a total clinical study.
- Only for IVD use.

CALIBRATION/QUALITY CONTROL

It is suggested to perform an internal quality control with urine with known concentrations.

TEST PERFORMANCE

Precision

Intra-assay (n = 20)	Mean (µg/l)	SD (µg/l)	CV%
Sample 1	153.0	5.6146	3.66
Sample 2	75.5	5.1248	6.79

Inter-assay (n = 20)	Media (µg/l)	SD (µg/l)	CV%
Sample 1	161.8	7.3456	4.54
Sample 2	76.2	6.4095	8.42

Sensitivity/limit of detection
The method is able to discriminate until 10 µg/l.

Linearity
The method is linear up to 250 µg/l.
If the sample should have a concentration more than 250 µg/l, dilute the treated urine sample with distilled water and repeat the analysis and consider the dilution in the final calculation.

Methods comparison
A comparison with a commercial available product gave the following results in a comparison on 50 samples of urine:

Iodide LTA = x
Iodide competitor = y
n = 50

y = 0,96078x + 8,67 r = 0,98452

WASTE DISPOSAL

Product is intended for professional laboratories. Waste products must be handled as per relevant security cards and local regulations.

PACKAGING

CODE CC02800	**(50 TESTS)**
Diluent for samples	1 x 50 ml
Reagent 1	1 x 75 ml
Reagent 2	1 x 10 ml
Standard 0 µg/l	1 x 2 ml
Standard 50 µg/l	1 x 2 ml
Standard 100 µg/l	1 x 2 ml
Standard 150 µg/l	1 x 2 ml
Standard 200 µg/l	1 x 2 ml

CODE CC02800/K	**(20 TESTS)**
Diluent for samples	1 x 20 ml
Reagent 1	1 x 30 ml
Reagent 2	1 x 4 ml
Standard 0 µg/l	1 x 2 ml
Standard 50 µg/l	1 x 2 ml
Standard 100 µg/l	1 x 2 ml
Standard 150 µg/l	1 x 2 ml
Standard 200 µg/l	1 x 2 ml

REFERENCES

Sam Pino et all. Clin.Chem 42:2;239-43(1996).
Meller B, Lauer I, Bahre M, Richter E. Influence of radioiodine therapy on urinary iodine excretion, Nuklearmedizin 1998 May; 37(3):107-12.
Mann K, Rendi J, Busley R, Saller B, Seybold S, Hoermann R, Sauerbruch T, Borner W., Systemic iodine absorption during endoscopic application of radiographic contrast agents for endoscopic retrograde cholangiopancreaticography. Eur J Endocrinol 1994 May; 130(5):498-501.

MANUFACTURER

LTA s.r.l.
Via Milano 15/F
20060 Bussero (Milan) ITALY
Tel: ++39 02 95409034
Fax: ++39 02 95334185
e-mail: info@ltaonline.it
Website: http://www.ltaonline.it

SYMBOLS

IVD Only for IVD use
LOT Lot of manufacturing
REF Code number
Storage temperature interval
Expiration date
Warning, read enclosed documents
Read the directions
Biological risk

Mod. 01.06 (ver. 2.2 – 17/09/2013)

CE