



UREA UV LR liquid reagent

REF C4800650A 6x50ml

CE C4800650 6x50ml

IVD For in vitro medical device

Use

Kit for measurement of urea in serum, plasma and urine. Kinetic UV method Urease-GLDH

Summary

Urea Increase in serum can be the result of kidney dysfunction or urinary tract obstruction.

Principle

Fixed time analysis. Urea is hydrolysed, in the presence of water, in urease to produce carbon dioxide. The ammonia produced, in the first reaction, combines with alpha-ketoglutarate and NADH which, in the presence of glutamate-dehydrogenase, forms glutamate and NAD+. The decrease in absorbance at 340 nm due to depletion of NADH is proportional to the urea concentration in the sample.

Reagents

| | | |
|-----------|----------------------|--------------|
| R1 | Goods buffer pH 7.6 | 130.0 mmol/l |
| | ADP | 1.2 mmol/l |
| | Urease | ≥ 8000 U/l |
| | GLDH | ≥ 1500 U/l |
| R2 | Goods buffer pH 10.2 | 100.0 mmol/l |
| | alpha-ketoglutarate | 65.0 mmol/l |
| | NADH | 1.20 mmol/l |

Preparation of Reagents

Reagents are liquid and ready to use. About using as monoreagent ("sample-starter" procedure) pour the content of R2 vial into the R1 vial and let stand for 15' at least. For minor use add to every 4 ml of R1 reagent, 1 ml of R2 reagent. Keep out the reagents from refrigerator only for the use and recap them immediately.

Storage and stability

- Store the kit at 2-8°C
- After opening, the vials R1, R2 are stable 90 days if recapped immediately and protected from contamination, evaporation, direct light, and stored at the correct temperature.
- Working solution stability (R1+R2): 20 days at 2-8°C.

Precaution in Use

The product is not classified as dangerous (DLg. N. 285 art. 28 l. n. 128/1998).

However the reagent should be handled with care, according to good laboratory practice.

Cautions: the reagents contain Sodium Azide (0.095%) as preservative. Avoid swallowing and contacting with skin, eyes and mucous membranes. In case of contact with eyes rinse immediately with plenty of water and seek medical advice.

Waste Management

Please refer to the local legal requirements.

Specimen collection and preparation

- Serum or plasma.
- Diluted urine 1:20.
- Do not use samples with haemolysis.
- Do not use ammonia-heparinate and fluorides as anticoagulants.
- The urea in the serum is stable up to 3 days if stand at 2-8°C or 3 months at -20°C.

Note

- The kit, according to this method, must be used in manual procedures. About automatic using follow specific applications.
- Avoid direct light, contamination and evaporation.
- The volumes in the procedure can be changed proportionally.
- In case of complaint or quality control request, refer to the lot number on the package or the lot number on the singles vials.

Procedure

Wavelength λ: 340 (334-365) nm
 Working temperature 37°C
 Optical path 1 cm
 Reaction "fixed time" (in decreasing)
 Bring the reagents at 15 -25°C before using them.

- Monoreagent Procedure "sample starter"

| | BLANK | STD | SAMPLE |
|-----------------|---------|---------|---------|
| Working reagent | 1000 µl | 1000 µl | 1000 µl |
| Distilled Water | 10 µl | -- | -- |
| Sample | -- | -- | 10 µl |
| Standard | -- | 10 µl | -- |

Mix, then incubate at 37°C. Measure the absorbance values of first reading after 30" from sample adding (E1C) and standard (E1STD). Read a second time after 60" (E2C), (E2STD).

- Bireagent Procedure "substrate starter"

| | BLANK | STD | SAMPLE |
|-----------------|--------|--------|--------|
| Reagent R1 | 800 µl | 800 µl | 800 µl |
| Distilled Water | 10 µl | -- | -- |
| Sample | -- | -- | 10 µl |
| Standard | -- | 10 µl | -- |

Mix, incubate at 37°C for 1' and then add:

| | BLANK | STD | SAMPLE |
|------------|--------|--------|--------|
| Reagent R2 | 200 µl | 200 µl | 200 µl |

Mix, then incubate at 37°C. Measure the absorbance values of first reading after 30" from sample adding (E1C) and standard (E1STD). Read a second time after 60" (E2C), (E2STD).

Calculation

$$\text{Urea [mg/dl]} \text{ o } [\text{mmol/l}] = \frac{(\text{E2C} - \text{E1C}) / (\text{E2STD} - \text{E1STD}) \times \text{Conc. STD}}{\text{Diluted urines: multiply the result for diluting factor.}}$$

Conversion Factor

$$\text{Urea [mg/dl]} \times 0.1665 = \text{Urea [mmol/l]}$$

Reference Values

| | |
|----------------|------------------------------------|
| Serum - plasma | 10 - 50 mg/dl (1.67 - 8.32 mmol/l) |
| Urine | 20 - 35 g/24h (333 - 583 mmol/24h) |

Reference values are considered indicative since each laboratory should establish reference ranges for its own patient population. The analytical results should be evaluated with other information coming from patient's clinical history.

ANALYTICAL PERFORMANCES

Linearity

Reaction is linear up to a concentration of 300 mg/dl (49.95 mmol/l) with a range of 4.9-300 mg/dl (0.81-49.95 mmol/l). Samples with values exceeding 300 mg/dl must be diluted with saline solution. Multiply, then, the result for diluting factor.

"Intra-Assay" precision (within-Run)

Determined on 20 samples for each control (N-H) (Normal-High). Results:

| | | |
|---------------|-----------|------------|
| MEANS [mg/dl] | N = 40.40 | H = 150.95 |
| S. D. | N = 1.50 | H = 2.18 |
| C.V.% | N = 3.70 | H = 1.44 |

"Inter-Assay" precision (between-Run)

Determined on 20 samples for each control (N-H) (Normal - High). Results:

| | | |
|---------------|-----------|------------|
| MEANS [mg/dl] | N = 40.63 | H = 152.05 |
| S. D. | N = 1.20 | H = 2.46 |
| C.V.% | N = 2.95 | H = 1.62 |

Analytical Sensitivity

The test sensitivity in terms of detection limit is 3.0 mg/dl (0.50 mmol/l).

Interferences

No interference was observed by presence of:
 Bilirubin ≤ 20 mg/dl.
 Triglycerides ≤ 1000 mg/dl.
 Hemoglobin ≤ 100 mg/dl.

Correlation

A study based comparing this method with a similar method on 20 samples has given a correlating factor $r = 0.99$

$$y = 1.147x + 0.061$$

Quality Controls

It's necessary, each time the kit is used, to make the quality controls and to check that values obtained are within the acceptance range provided in the insert each laboratory should establish its own mean and standard deviation and adopt a quality control program to monitor laboratory testing.

Bibliography

Talke H, Schubert GE: Klin Wchrs., (1965), 43, 174.

Kaplan LA, Pesce AJ: "Clinical Chemistry", Mosby Ed. (1996).

Symbols

| | |
|-----|-------------------------------|
| CE | CE Mark (98/79 CE regulation) |
| IVD | in vitro medical device |
| LOT | Batch Code |
| | Use by |
| | Storage temperature limits |
| | Read instruction for use |
| | Producer |

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Urea UV LR

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