

# DIAGNOSTIC KIT FOR DETERMINATION OF THEOPHYLLINE CONCENTRATION

## HC-THEOPHYLLINE



### INTRODUCTION

Theophylline is used mainly in the treatment of asthma and obstructive lung diseases. It has anti-inflammatory, diuretic and diastolic effect: dilate bronchi, blood vessels and bile ducts. The mechanism of theophylline action at the cellular level is complex and not fully understood. Theophylline concentration in serum depends on its absorption, metabolism, concomitant treatment. Monitoring theophylline level in serum is recommended both in the treatment of chronic diseases and acute conditions. It allows establish an individual therapeutic range to reduce side effects and the risk of overdose.

### METHOD PRINCIPLE

Immunoturbidimetric method; inhibition of agglutination. Increase of absorbance measured at  $\lambda = 600$  nm is inversely proportional to the concentration of theophylline in the sample. Theophylline which is present in the sample forms immune complexes with specific antibody contained in the first reagent. After adding a second reagent containing polystyrene latex particles coated with theophylline, agglutination is inhibited in proportion to theophylline concentration in the sample.

### REAGENTS

#### Package

1-Reagent	2 x 18 ml
2-Reagent	1 x 6 ml

Unopened reagents stored at 2-8°C are stable up to the expiry date printed on the package. After opening the reagents are stable for 21 days on board the analyser at 2-10°C. Protect from light!

### Reagents composition

Bis-Tris buffer, monoclonal antibodies to theophylline, polystyrene latex particles coated with theophylline, sodium azide (< 0.1%).

### Warnings and notes

- Products for in vitro diagnostic use only.
- The reagents should be used by suitably qualified laboratory personnel only in accordance with intended purpose.
- The reagents contain sodium azide as a preservative (< 0.1%). Avoid contact with skin and mucous membranes. Sodium azide can form high explosive metal azide combinations with lead and copper. Drains should be flushed well with a large amount of water when discarding the solution.
- Mix well Reagent 2 before first use. Avoid foam formation.
- For optimal reagents stability it is recommended to remove them from the system and store in tightly closed bottles at 2-8°C.

### SPECIMEN

Serum. Samples may be stored up to 3 days at 2-8 °C. or longer at -20°C. Nevertheless it is recommended to perform the assay with freshly collected samples!  
Avoid repeated freezing and thawing. Mix well the samples before analysis.

### PROCEDURE

These reagents may be used in automatic analyser Hitachi 911/912. 1-Reagent and 2-Reagent are ready to use.

1-Reagent	Read code by barcode-reader
2-Reagent	Read code by barcode-reader

Wavelength:

Main	600 nm
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### THERAPEUTIC RANGE

therapeutic concentration 10-20µg/ml (55.5-111µmol/l)

Some patients achieve the desired therapeutic response at levels outside this range, so it is recommended to consider the need to establish an individual therapeutic ranges for each patient.

### QUALITY CONTROL

For internal quality control it is recommended to use the CORMAY TDM CONTROLS (Cat. No 5-107) with each batch of samples. For the calibration of automatic analysers systems the CORMAY THEOPHYLLINE CALIBRATORS (Cat. No 5-109) is recommended.

The calibration curve should be prepared every 7 days, with change of reagent lot number or as required e.g. quality control findings outside the specified range.

### PERFORMANCE CHARACTERISTICS

Metrological characteristics may differ from values presented below with the instrument used.

- Sensitivity / Limit of Detection:** 0.3µg/ml (1.67 µmol/l).
- Linearity:** up to 40 µg/ml (222 µmol/l). If the theophylline concentration exceeds 40 µg/ml, dilute the sample 1:8 with saline solution and repeat the assay. The dilution take into account when making the results.
- Specificity / Interferences**  
Haemoglobin up to 0.5 g/dl, bilirubin up to 20 mg/dl, fatty acids up to 2.9 g/dl, do not interfere with the test.

### Precision

Repeatability (run to run) n = 10	Mean [µg/ml]	SD [µg/ml]	CV [%]
level 1	4,75	0,10	2,10
level 2	13,87	0,18	1,30
level 3	27,55	0,67	2,43

Reproducibility (day to day) n = 10	Mean [µg/ml]	SD [µg/ml]	CV [%]
level 1	4,91	0,06	1,22
level 2	13,77	0,31	2,25
level 3	27,75	0,83	2,99

### Method comparison

A comparison between CORMAY reagent (y) and commercially available assay (x) using 49 samples gave following results:

$$y = 0.95x + 1.126 \mu\text{g/ml};$$

$$R = 0.9879 \quad (R - \text{correlation coefficient})$$

### WASTE MANAGEMENT

Please refer to local legal requirements.

## LITERATURE

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