New quality
in determination of TIBC

Total Iron-Binding Capacity (TIBC)

DIRECT METHOD

- **Reduce the time associated with the assay**
- **Determination can be conducted in a single vessel and in a relatively short period of time**
- **Reduce sample manipulation steps**
- **Set can be applied to any automated chemical analysers**

Total iron-binding capacity indicates the maximum amount of iron necessary to saturate all available transferrin iron-binding sites. Therefore, TIBC correlates well with transferrin concentration. Measurements of TIBC, serum iron, and the ratio of serum iron to TIBC (transferrin saturation) are widely used for the clinical diagnosis and monitoring of treatment for iron-deficiency anemia and chronic inflammatory diseases as well as for screening tests for other clinical goals. Methods of TIBC determination: calculated TIBC, indirect, direct.

Calculated TIBC

TIBC may be calculated from the sum of measured unsaturated iron-binding capacity (UIBC) and measured iron (Fe):

TIBC = UIBC + Fe

- This approach requires two separate analysis: serum iron and serum UIBC
- Moreover, when either serum iron or UIBC values are below the detection limit, the TIBC value cannot be calculated

Indirect determination of TIBC

The indirect procedure involves centrifugation or pretreatment of serum samples to remove unbound iron after transferrin saturation:

- An excess of iron is added to fully saturate all serum iron-binding sites
- Any remaining free iron is then removed by a solid-phase adsorbent (magnesium carbonate)
- The TIBC is determined by a serum iron test. This method requires a separation step and manual manipulation of the samples

Direct determination of TIBC (d-TIBC)

Principle of the test:

Step A: Fe^{3+} + CAB + Fe-TRF ⇒ Fe-CAB + TRF

Step B: Fe-CAB + TRF ⇒ Fe-TRF + Fe-CAB /ph ≥ 7,2/

Direct TIBC reagent set

Reagent 1 contains:

- CAB (chromazurol B)
- CTAB (cetrimonium bromide)
- $FeCl_3$ (ferric chloride)
- in acetate buffer - pH ≥ 4,5

Reagent 2 contains:

- $NaHCO_3$ (sodium bicarbonate)
- in MOPS buffer - pH ≥ 7,2

Specification

Reagent preparation:

- R1 and R2 are ready to use

Reagent storage:

- 2 - 8°C ≤ 12 months

Specimen storage and collection:

- Serum is the specimen of choice
- Serum can be stored up to 3 days at 4°C or up to 6 months at -20°C or also at -70°C indefinitely.

Comparison

Commercial reagent set of the same methodology d-TIBC:

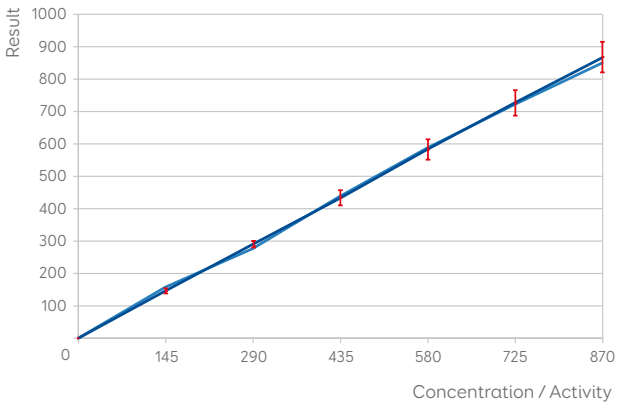
- Linearity between 77 and 694 µg/dL TIBC
- Correlation R = 0,991 (Hitachi / Cobas)
- Stability of the calibration 4 weeks
- On board stability 4 weeks

Cormay d-TIBC reagent set:

- Linearity between 50 - 600 ug/dl TIBC
- Correlation R = 0.96 (BS-400 / Advia)
- Stability of the calibration 11 weeks*
- On board stability 11 weeks*

*for BS-400

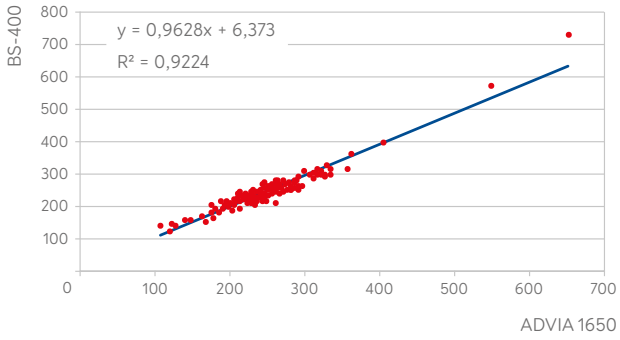
Linerity



*measured on BS-400

Correlation results

A comparison between TIBC values determined at BS-400 (y) and at Advia 1650 (x) using 149 samples gave following results:



Conclusions

Cormay d-TIBC determination reduces the time associated with the assay, can reduce sample manipulation steps, can be conducted in a single vessel and in a relatively short period of time.

Cormay d-TIBC Reagent Set can be applied to any automated chemical analysers.

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