New quality in determination of TIBC

Total Iron-Binding Capacity (TIBC)

- **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 - CAB + TRF /ph ≥ 4,5/

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

Direct TIBC reagent set

Reagent 1 contains:

- CAB (chromazurol B)
- CTAB (cetrimide)
- $FeCl_3$ (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 may be stored at 2 - 8°C up to 1 month
- Serum can be stored at 20 - 25°C for 2 weeks

Comparison

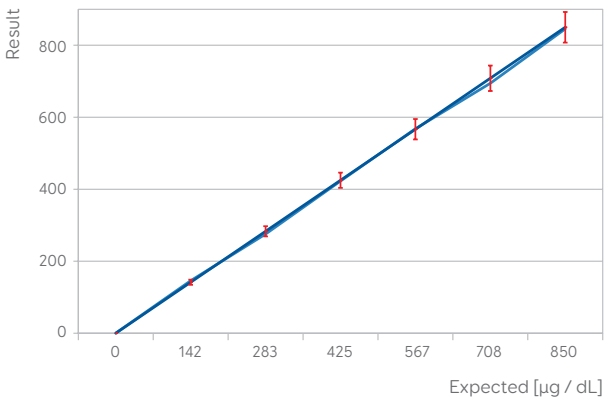
Commercial reagent set of the same methodology d-TIBC:

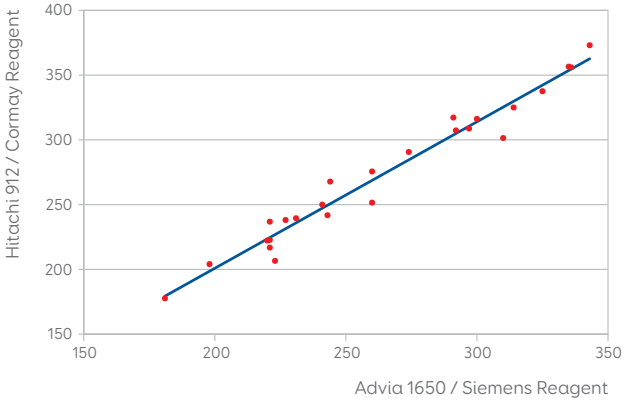
- Linearity between 70 and 700 µg / dL TIBC
- Correlation R = 0,991 (Hitachi / Cobas)
- Stability of the calibration 7 days
- On board stability 7 days

Cormay d-TIBC reagent set:

- Linearity between 50 and 850 µg / dL TIBC
- Correlation R = 0,987
- Stability of the calibration ≥ 7 days
- On board stability 14 days

Excelent linearity





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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Specifications are correct at the time of printing: 06/2016.