TAS | Total Antioxidant Status

Summary and Explanation

Reactive oxygen species (ROS) is produced in metabolic and physiological processes, and harmful oxidative reactions may occur in organisms that remove them via enzymatic and nonenzymatic antioxidative mechanisms. Under certain conditions, the increase in oxidants and decrease in antioxidants cannot be prevented, and the oxidative or in over 100 disorders, develops .

Antioxidant molecules prevent or inhibit these harmful reactions2 . Serum (or plasma) concentrations of different antioxidants can be measured in laboratories separately, but the measurements are time-consuming, labor-intensive, costly, and require complicated techniques. Because the measurement measurement of different antioxidant molecules separately is not practical and their antioxidant effects are additive, the total antioxidant capacity of a sample is measured, and this is called total antioxidant capacity (TAC) 3 , total antioxidant activity (TAA) 4 , total antioxidant power (TAOP) 5 , total antioxidant status (TAS) 6 , total antioxidant response 7 , or other synonyms

Principle of Assay

Antioxidants in the sample reduce dark blue-green colored ABTS radical to colorless reduced ABTS form. The change of absorbance at 660 nm is related with total antioxidant level of the sample. The assay is calibrated with a stable antioxidant standard solution which is traditionally named as Trolox Equivalent that is a vitamin E analog .

Reagent Composition

Content		Concentration
Reagent 1	Buffer Solution	
	Acetate Buffer	0.4 mol/L pH5.8
Reagent 2	Prochromogen Solution	
	ABTS	30 mmol/L
Standard	Trolox	1 mmol / L
QC Level 1	Trolox	0.5 mmol / L
QC Level 2	Trolox	2.0 mmol / L

Storage/Stability

The kit is shipped on wet ice and storage at 2–8 °C is recommended. Stable up to expiry date when stored capped and at 2–8 °C even after start using.

Normal Range

Human Serum: 1.20 – 1.50 mmol/L (1200 – 1500 umol/L)

Each laboratory is recommended to establish their own reference values.

Performance Characteristics

Precision

Inter-assay coefficent of variation 2.8%

Intra-assay coefficent of variation 3.3%

Assay Range

Samples containing 0.1 – 3.5 mmol Trolox Equiv. /L can be assayed without further dilution or concentration.

Interferences

EDTA interfere with the results.

Sample

Blood serum, plasma, semen plasma, saliva, urine, cell lysates, tissue homogenates, beverages, fruit juices and oils (oils require different reagent 1) can be used as sample.

Serum samples are stable up to 1 week stored at 4˚C, 6 months at -20˚C and 1 year at -80˚C.

Safety Precautions and Warnings

1. For in vitro diagnostic use only.

2. Do not pipette by mouth.

3. Exercise the normal precautions required for handling laboratory reagents.

4. Wear disposable gloves while handling the kit reagents and wash hands thoroughly afterwards.

5. Do not use reagents beyond the expiry date.

6. The reagents must be used only for the purpose intended by suitably qualified laboratory personnel, under appropriate laboratory conditions.

7. Dispose cleaning liquid and also such used washing cloth or tissue paper with care, as they may also contain infectious agents.

8. Health and safety data sheets are available on request.

Procedure

Wavelength	660nm
Pipette into cuvette as below order	
Sample OR Standard OR H_20	18 µl
Reagent 1	300 µl
Mix well	
Read absorbance (A1) after 30 seconds	
Reagent 2	45 µl
Mix well	
Read absorbance (A2) after 5 minutes at 37˚C OR	
Read absornabce (A2) after 10 minutes at RT	

Calculation

A2 – A1 = ΔAbs of standard or sample or H_20

$$\text{Results} = \frac{[\Delta Abs\ H_2O - \Delta Abs\ Sample]}{[\Delta Abs\ H_2O - \Delta Abs\ Standard]}$$

References

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