PERFORMANCE CHARACTERISTICS

A) Internal Evaluation:

1. Accuracy: In an internal study **Electra™ TSH** was evaluated against commercially available licensed kit with 90 random clinical samples, & **Electra™ TSH** has demonstrated >98% clinical correlation with the commercially available licensed kit.
2. Precision: **Electra™ TSH** was evaluated with licensed external Quality controls for Precision Studies & following is the data:

Controls	No. of testings	Mean Control values with Electra™ TSH	Coefficient of Variable (CV)
Level 1	10	0.364	7.45
Level 2	10	5.501	6.65
Level 3	10	37.40	4.40

B) External Evaluation:

Electra™ TSH CLIA has been evaluated by a NABL accredited lab against their reference method. In this evaluation **Electra™ TSH** has demonstrated 100% correlation with the reference method.
*Data file: Zephyr Biomedicals (A Division of Tulip Diagnostics Pvt. Ltd).

Important Note:

1. The **Electra™ TSH** assay is a temperature sensitive assay. The best temperature condition for this assay is from 18°C to 22°C.
2. The wash procedure is critical. Insufficient washing will result in poor precision and falsely elevated absorbance readings.
3. It is recommended to use the multi channel pipettes to avoid time effect. A full plate of 96 wells may be used if automated pipette is available.
4. Duplication of Standards & samples is not mandatory but may provide information on reproducibility & application errors.

LIMITATIONS OF THE ASSAY

(1). As with all diagnostic tests, a definite clinical diagnosis should not be based on the results of a single test, but should only be made by the physician after all clinical and laboratory findings have been evaluated. (2).The activity of the enzyme used is temperature-dependent and the RLU values may vary. The higher the room temperature (+18°C to +25°C) during substrate incubation, the greater will be the RLU values. Corresponding variations apply also to the incubation times. However, the Standards are subject to the same influences, with the result that such variations will be largely compensated in the calculation of the result. (3). Adaptation of this assay for use with automated sample processors and other liquid handling devices, in whole or in part, may yield differences in test results from those obtained using the manual procedure. It is the responsibility of each laboratory to validate that their automated procedure yields test results within acceptable limits. (4).Insufficient washing (e.g., less than 5 wash cycles, too small wash buffer volumes, or shortened reaction times) can lead to incorrect results.

BIBLIOGRAPHY

(1). Rongen HA, Hoetelmans RM, Bult A, van Bennekom WP. Chemiluminescence and immunoassays. **J Pharm Biomed Anal** 1994 Apr;12(4):433-62. (2). Koszegi T, Immunoluminometric detection of human procalcitonin. **J BiochemBiophys Methods** 2002 Oct;53(13):157-64. (3). Roda A, Simoni P, Mirasoli M, Baraldini M, Violante FS. Development of a chemiluminescent enzyme immunoassay for urinary 1-hydroxypyrene **AnalBioanalChem** 2002 Apr;372(7-8). (4). Skelley, D., Brown, L., and Besch, P. Radioimmunoassay. **Clin. Chem.** 19:146;1973. (5). Wistom, G.B. Enzyme-Immunoassay. **Clin.Chem** .22: 1243; 1976. (6). Schuurs, A.H.W.M. and Van Weeman, B.K. Review, Enzyme immunoassay. **Clin.Chem. Acta.** 81:1; 1977. (7). Ravel, R. **Clinical Laboratory Medicine.** Year Book Medical Publ. Chicago. (1973). (8). Robbins, J. Radioassay and Thyroid Gland. **Metabolism** 22:1021; 1973.

SYMBOL KEYS

Temperature Limitation	Consult Instructions for use	Date of Manufacture	Batch Number / Lot Number
Manufacturer	*In vitro* Diagnostic Medical Device	This side up	Contains sufficient for <n> tests
Use by	Catalogue Number	Do not reuse	

Manufactured by:

Zephyr Biomedicals

A Division of Tulip Diagnostics (P) Ltd.

M 46-47, Phase III B, Verna Industrial Estate, Verna, Goa- 403 722, INDIA.

Regd. Office: Gitanjali, Tulip Block, Dr. Antonio Do Rego Bagh, Alto Santacruz, Bambolim Complex P.O., Goa - 403 202, INDIA.

An ISO 13485 Certified Company

1119/VER-01

electra™ TSH

Chemiluminescence Assay for the Quantitative Determination of Thyroid Stimulating Hormone (TSH) in Human Serum.

FOR IN VITRO DIAGNOSTIC USE ONLY

Store at 2°C to 8°C

INTENDED USE

ELECTRA™ TSH CLIA test is intended for the quantitative determination of Thyroid Stimulating Hormone (TSH) in human serum. For In Vitro Diagnostic Use only.

INTRODUCTION

TSH is secreted by the anterior lobe of the pituitary gland and induces the production and release of thyroxine and triiodothyronine from the thyroid gland. Although the concentration of TSH in the blood is extremely low, it is essential for the maintenance of normal thyroid function. TSH and the pituitary glycoproteins: luteinizing hormone (LH), follicle-stimulating hormone (FSH), and human chorionic gonadotropin (hCG), have identical alpha chains. The beta chain is distinct but does contain identical amino acid sequences, which can cause considerable cross-reactivity with some polyclonal TSH antisera. The use of a monoclonal antibody in this TSH EIA test eliminates this interference, which could result in falsely elevated TSH values in either menopausal or pregnant females--a population whose evaluation of thyroid status is clinically significant.

PRINCIPLE

ELECTRA™ TSH Quantitative CLIA assay is for use on **ELECTRA** analyzers. **ELECTRA™ TSH CLIA** works on the principle of chemiluminescence wherein light is produced by a chemical reaction from a substance as it returns from an electronically excited state to the ground state. When catalysed by HRP, the oxidation of luminol by hydrogen peroxide produces an electronically excited form of 3-aminophthalate which on relaxation emits light with maximum intensity at λ=425nm.
The **ELECTRA™ TSH CLIA** test utilizes a unique monoclonal antibody directed against a distinct antigenic determinant on the intact TSH molecule. Mouse monoclonal anti-TSH antibody is used for solid phase (microtiter wells) immobilization and a goat anti-TSH antibody is in the antibody-enzyme (horseradish peroxidase) conjugate solution. The test sample is allowed to react simultaneously with the two antibodies, resulting in the TSH molecules being sandwiched between the solid phase and enzyme-linked antibodies. After incubation, the wells are washed by wash buffer to remove unbound anti-TSH conjugate. A solution of chemiluminescent substrate is then added and Luminescence is measured in RLU. The intensity of the emitting light is proportional to the amount of enzyme present and is directly related to the amount of TSH in the sample. By reference to a series of TSH standards assayed in the same way, the concentration of TSH in the unknown sample is quantified.

MATERIALS & COMPONENTS

Materials provided with the test kits:

- Coated Microwells: Microwells coated with Anti- TSH antibody.
- TSH HRPO Enzyme Conjugate (20X)
- Substrate A: Chemiluminescent substrate containing enhanced luminol solution.
- Substrate B: Chemiluminescent substrate containing stabilized peroxide solution.
- TSH Standard set of 7 standards labeled as A to G in liquid form. Ready to use. For standard Concentrations refer vial label.
- Wash Buffer Concentrate (20X).

Materials required but not provided:

- Precision pipettes: 10-100µl, 50-200µl, 100-1000µl
- Disposable pipette tips
- Distilled water
- Disposable Gloves
- **ELECTRA™ Analyzer**

STORAGE AND STABILITY

1. **ELECTRA™ TSH** kit is stable at 2-8°C up to the expiry date printed on the label.
2. Coated micro-wells should be used within one month of opening the pouch. Once opened, the pouch must be sealed properly to protect from moisture. In case the desiccant pouch changes color from blue to white, the strips should not be used.
3. Diluted wash buffer is stable up to one week at 2-8°C.
4. Working Substrate (A+B) must be used immediately.

SPECIMEN COLLECTION

1. Collect blood specimen by venipuncture according to the standard procedure.
2. Only serum should be used.
3. Avoid grossly hemolytic, lipemic or turbid samples.
4. Preferably use fresh samples. However, specimens can be stored up to 48 hours at 2-8°C, for short duration.
5. For longer storage, specimens can be frozen at -20°C. Thawed samples must be mixed prior to testing.
6. Do not heat inactivate before use.
7. Specimen containing precipitate or particulate matter should be clarified by centrifugation prior to use.
8. Specimen should be free from particulate matter and microbial contamination

PRECAUTIONS

1. Bring all reagents and specimen to room temperature before use.
2. Do not pipette any material by mouth.
3. Do not eat, drink or smoke in the area where testing is done.
4. Use protective clothing and wear gloves when handling samples.
5. Use absorbent sheet to cover the working area.
6. Immediately clean up any spills with sodium hypochlorite.
7. All specimens and standards should be considered potentially infectious and discarded appropriately.
8. Neutralize acid containing waste before adding hypochlorite.
9. Do not use kit after the expiry date.
10. Do not mix components of one kit with another.
11. Always use new tip for each specimen and reagent.
12. Do not allow liquid from one well to mix with other wells.
13. Do not let the strips dry in between the steps.

REAGENT PREPARATION

- All reagents should be brought to room temperature (18-25°C) and mixed by gently inverting or swirling prior to use. Do not induce foaming.
- Dilute Wash Buffer 20 times (for example add 5ml concentrated buffer to 95 ml distilled or deionized water). Mix well before use.
- Prepare a Working Substrate by Mixing Substrate A and Substrate B in equal volume (1:1 ratio) before addition to the micro-wells

No. of Strips	1	2	3	4	5	6	7	8	9	10	11	12
Substrate-A µl	250	450	650	850	1050	1250	1450	1650	1850	2050	2250	2450
Substrate-B µl	250	450	650	850	1050	1250	1450	1650	1850	2050	2250	2450

TEST PROCEDURE

1. Secure the desired number of coated wells in the holder. Dispense **25**µl of Standards & Serums into the appropriate wells.
2. Dispense **50**µl of Enzyme Conjugate into each well. Incubate at room temperature (18-25°C) for **30 minutes**.
3. Remove the incubation mixture by emptying the plate content into a waste container. Rinse and empty the microtiter plate 5 times with Wash Buffer (1X). Strike the microtiter plate sharply onto the absorbent paper or paper towels to remove all residual water droplets.
4. Add **50** µl of working Substrate (A+B) in all the micro-wells. Keep away from direct light while adding the substrate.
5. Cover the **ELECTRA**™ microplate and incubate for **10** minutes at room temperature (18-25°C) in dark.
6. Read the **ELECTRA**™ micro-plate exactly at **10** minutes in **ELECTRA** ™ **Analyzer.** If **ELECTRA**™ micro-plate is not read between 10-15 minutes the test results should be considered as invalid.

Add **25** µl Standards/samples into the respective Microwell

↓

Add **50** µl Enzyme conjugate in each well

↓

Apply plate sealer and incubate for **30** minutes at **18-25°C**

↓

Wash Microwells **5 times** with 350 µl **of** diluted wash buffer

↓

Add **50** µl Substrate in each well

↓

Incubate for **10** Minutes at **18-25°C in dark**

↓

Read results on **ELECTRA** ™ Analyzer exactly at the end of **10** Minutes

CALCULATIONS

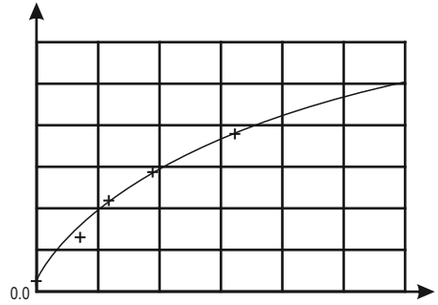
Construct a standard curve by plotting the RLU obtained from each reference standards against its concentration in µIU/ml on the graph paper, with RLU values on the vertical or Y axis and concentrations on the horizontal or X axis. Use the RLU values for each specimen to determine the corresponding concentration of TSH in µIU/ml from the standard curve. Any diluted specimens must be corrected by the appropriate dilution factor.

Example of Standard curve

Results of a typical standard run with RLU's shown in the Y axis against TSH concentrations shown in the X axis.

Suggest: Use 4-Parameter Standard curve to calculate sample values.

TSH Values (µIU/ml)	RLU's
A	282
B	1352
C	24686
D	116002
E	369257
F	922318
G	1775217



This Standard curve is for the purpose of illustration only and should not be used to calculate unknowns. Each user should obtain their own Standard curve and data.

Expected Ranges of values

Based on a study of 139 random normal adult blood samples, normal TSH values and ranges (in µIU/ml) were shown in the following table.

Low Normal	0.39	Low Range	0.28 – 0.53
High Normal	6.16	High Range	5.60 – 6.82

The minimum detectable concentration of TSH by this assay is estimated to be 0.02 µIU/ml.