ASTREE Electronic Tongue
Data sheet

ASTREE is an electronic tongue dedicated to taste analysis. This technology is based on potentiometric measurement using sensing electrodes, in order to assess the overall taste profile and compare samples taste.

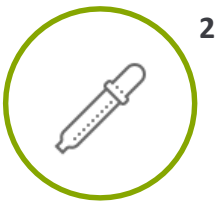
The system is composed of:

- An autosampler for the automated analysis of a samples set in reproducible conditions (time & stirring)
- A detection system composed on an array of 7 liquid sensors
- A computer with AlphaSoft software for system monitoring, data acquisition and data processing

Working principle

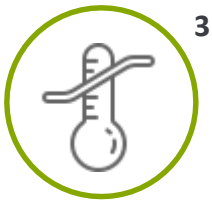
1

Product selection



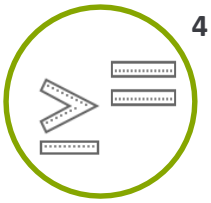
2

Sampling



3

Sample measurement



4

Taste comparison

1/ Select several samples with different taste properties (different recipes for product development and benchmarking, active formulation and placebo for taste masking, etc). Measurement of standard solution added to the reference sample can be proposed in order to characterize a given taste. Liquid matrix or solids dissolved in a liquid can be analyzed and compared.

2/ An autosampler allows repeatable contact of the sensors with the liquid by constant stirring and timing during analysis. No complex preparation is needed: fill in the beakers with the liquid samples and put them on the tray.

3/ An array of 7 sensors records the potentiometric variation between electrodes. Each sensor is cross-sensitive to different molecules or ions dissolved in the matrix. The information combination of the 7 sensors is used to investigate taste profile variation since they are complementary.

4/ Thanks to AlphaSoft, direct ranking can be done for sourness, saltiness and umami based on sensor selectivity and for molecule-related ranking by the standard addition method. The comparative results are displayed as taste mapping or ranking with relative score for easy-to-read information.
The electronic tongue allows a comparative taste analysis of product to assess the impact of recipe variations.

Sensors' measurement method can be adapted to your matrix. **Please contact us to organize a feasibility study!**

ASTREE electronic tongue

Liquid sensors

- ChemFET sensor technology (Chemical modified Field Effect Transistor)
  - ✓ Organic membrane interacting with ionic, neutral & chemical compounds
  - ✓ Measurement of a potentiometric difference between the sensors and a reference electrode
- Array of 7 liquid sensors sensitive to dissolved taste compounds
  - ✓ Sensors set directly dipped into the liquid product for analysis
  - ✓ Sensitivity to a wide range of compounds

Sample requirements

- Propanol and ethanol content: max 50%
- Range of solvent viscosity:
  - ✓ PEG 400 10% in water and PEG 400 65% in water can be analyzed without any specific precaution.
  - ✓ Analysis of PEG 400 more than 65% in water is not recommended
- Solvents prohibited to avoid damaging sensors: Ketones (acetone), chloro (chloroform, dichloromethane), nitriles (acetonitrile), H_2SO_4, HNO_3

General features

- Acquisition board : acquisition frequency 10 Hz
- Main board for data processing : RS232 interface
- Power supply : 110-120 VAC (Power consumption 3.15A) / 220-240 VAC (Power consumption 1.6 A)
- Dimensions: 260 x 300 x 100mm (LxWxH)
- Mass : 25 kg
- Operating conditions: constant ambient temperature (15 to 25°C±3°C)

Autosampler

- Programmable sample sequence run
- Fully automated sensor analysis procedure
- Analysis run : 3 min / measurement
- 16 or 48 position carrousel (min. 80mL & 20mL of liquid sample respectively)
- Reproducible stirring and measurement conditions
- Line voltage: 100-120 V; 220-240 V (Power consumption 40 VA)

AlphaSoft Software

Compatible with Windows® 7 and Windows® 10. This software controls and monitors the instrument and includes a full chemometrics package for data processing.

System monitoring and data acquisition

- Method / sequence including the autosampler monitoring
- Application wizard for automatic sequences and models

Data processing by multivariate statistics

- Libraries loading
- Sensors selection
- Models building and identification of unknown samples
- Qualitative and quantitative tools
  - ✓ PCA (Principal Components Analysis): discrimination between samples
  - ✓ DFA (Discriminant Factorial Analysis): qualitative model and unknown sample identification
  - ✓ PLS (Partial Least Square): quantification and sensory panel score prediction samples
- Sensor drift compensation procedure
- Data traceability with logbook and operating condition history
- Data validation by electronic signature

Maintenance tools

- System diagnostic: complete autotest of the autosampler and the unit, sensors diagnostic
- User preferences.