



# Benchmarking Analysis

## Application to Pharmaceutical Tablets

Results obtained at Alpha MOS Laboratory, Toulouse, France

Taste and aroma formulations are a major concern in the pharmaceutical industry, not only in OTC (Over the Counter) or nutraceutical products but also for generic and prescription drugs.

### The Objective and Experimental Plan

The Astree Electronic Tongue has been used to compare antacids. This application note presents the results in comparison with the Arthur D. Little Article (Jeff Worthington, Pharmaceutical Executive, April 2001). This article presents the importance of sensory tests to develop palatable medicines. A real case study compares the performance of popular OTC antacids. Tablet antacids have been analyzed with a sensory panel by quantifying two attributes: bitterness and sourness. The bitterness assessment is reported in the following table:

	Bitterness Score
<b>Roloids®</b>	<b>1.3</b>
<b>Tums®</b>	<b>0.6</b>
<b>Mylanta®</b>	<b>1.6</b>
<b>Zantac®</b>	<b>4.2</b>
<b>Tagamet®</b>	<b>4</b>

### Samples

Seven antacids tablet formulations from different pharmaceutical manufacturers have been analyzed: **Tums®** (berries or orange + active drug: Calcium Carbonate), **Tagamet®** (active drug: Cimetidine), **Roloids®** (freshmint or peppermint + active drug: Calcium and Magnesium Carbonate), **Zantac®** (active drug: Ranitide Hydrochloryde), **Mylanta®** (active drug: Calcium and Magnesium Carbonate).

The samples are prepared as it is prescribed in the instructions of the medicine.

### Analytical Conditions

α Astree – 7 sensors pre selected for pharmaceutical applications.

Sample volume used ml	100	Temperature	ambient
Time between 2 analysis (sec)	180	Acquisition time (sec)	120

### Method Repeatability

To determine the repeatability of the method, an RSD has been computed on the measurement for four replicates of a single sample. The results are presented in the table.

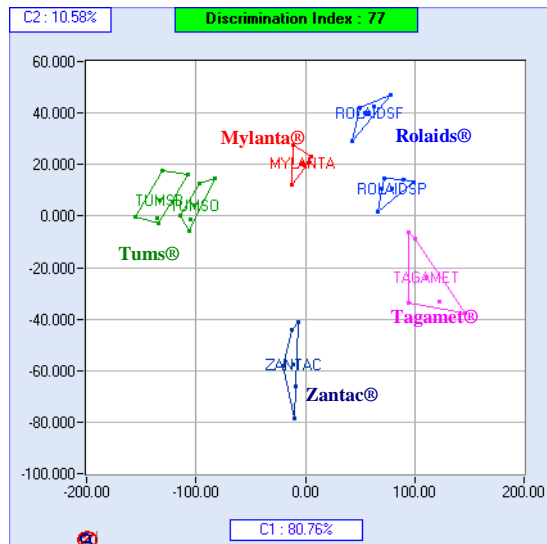
Sensor	1	2	3	4	5	6	7
RSD	0.09	0.11	0.12	0.17	0.13	0.21	0.12

Based on the repeatability of the measurement, the method can be considered acceptable for use for the study.

### Comparison of Antacids Tablets

All the analysis have been presented on a PCA graph:

- The differentiation between the samples is done mainly in function of the active drug:
  - **Roloids®** and **Mylanta®** have the same active drug and they are located in the same part of the graph.
  - The samples with the same active drug but with two different flavors are clustered together for example the 2 **Tums®** and the 2 **Roloids®**.
- Zantac®** is the most different sample.



## Conclusion

The Astree - fast, objective, flexible and cost effective:

- Introduces new formulations that are more customer oriented.
- Helps you to launch product on the market faster without safety risks and liability issues.
- Determines the taste attributes of new products, including bitterness and masking with results that are comparable to human panels.

## Correlation with the Sensory Panel for the Bitterness Measurement

- A PLS has been built with the Electronic Tongue values and the values coming from the sensory panel on the bitterness assessment.
- The correlation coefficient obtained is of 0.9674 so there is an excellent correlation between the Electronic Tongue and the sensory panel.
- The electronic tongue can be used to predict the bitterness of a formulation.

