

The SNIF-NMR[®] CONCEPT

All versions

A complete, integrated environment covering every step of the SNIF-NMR[®] analysis

Stable isotope analyses are among the most powerful techniques to ensure food and beverage authenticity. Based on the principle that the bioelements, C, H, O, N, of organic matter exist in their naturally occurring isotopic form – $^{13}\text{C}/^{12}\text{C}$, $^2\text{H}/^1\text{H}$, $^{18}\text{O}/^{16}\text{O}$, $^{15}\text{N}/^{14}\text{N}$ – the distribution of which is influenced by physical, chemical and biochemical factors, these methods offer a means of verifying botanical, synthetic and even geographical origin of a product.

The SNIF-NMR[®] method, pioneered by Professor G.J. Martin of the University of Nantes and further developed by Eurofins, makes up part of this stable isotope tool box. Using ^2H NMR spectroscopy, this technique is able to measure non-statistical distribution of deuterium in different sites of a given molecule.

An officially-recognised method

SNIF-NMR[®] is the official method of the OIV (International Wine Office) and the European Commission to control wine chaptalisation, the practice of adding sugar to the fermenting grape must during wine production to increase final alcohol content. It is now an official AOAC (Association of Official Analytical-Chemists) method for detecting sugar addition to fruit juice and for authenticating the natural origin of vanillin.



A high-tech and user-friendly solution

Eurofins has developed a push-button system to help laboratories to carry out SNIF-NMR[®] analyses, covering every step from sample preparation to the interpretation of results. The SNIF-NMR[®] Concept has been designed so that even non-specialists of NMR spectroscopy can perform in-house analyses.

A Eurofins – Bruker partnership

Combining experience in their respective fields, Eurofins and instrument manufacturer Bruker Biospin, offer a total system for carrying out SNIF-NMR[®] analyses. These can be run on Bruker Avance, Avance II and Avance III, AMX, DRX, DPX spectrometers.

Eurofins

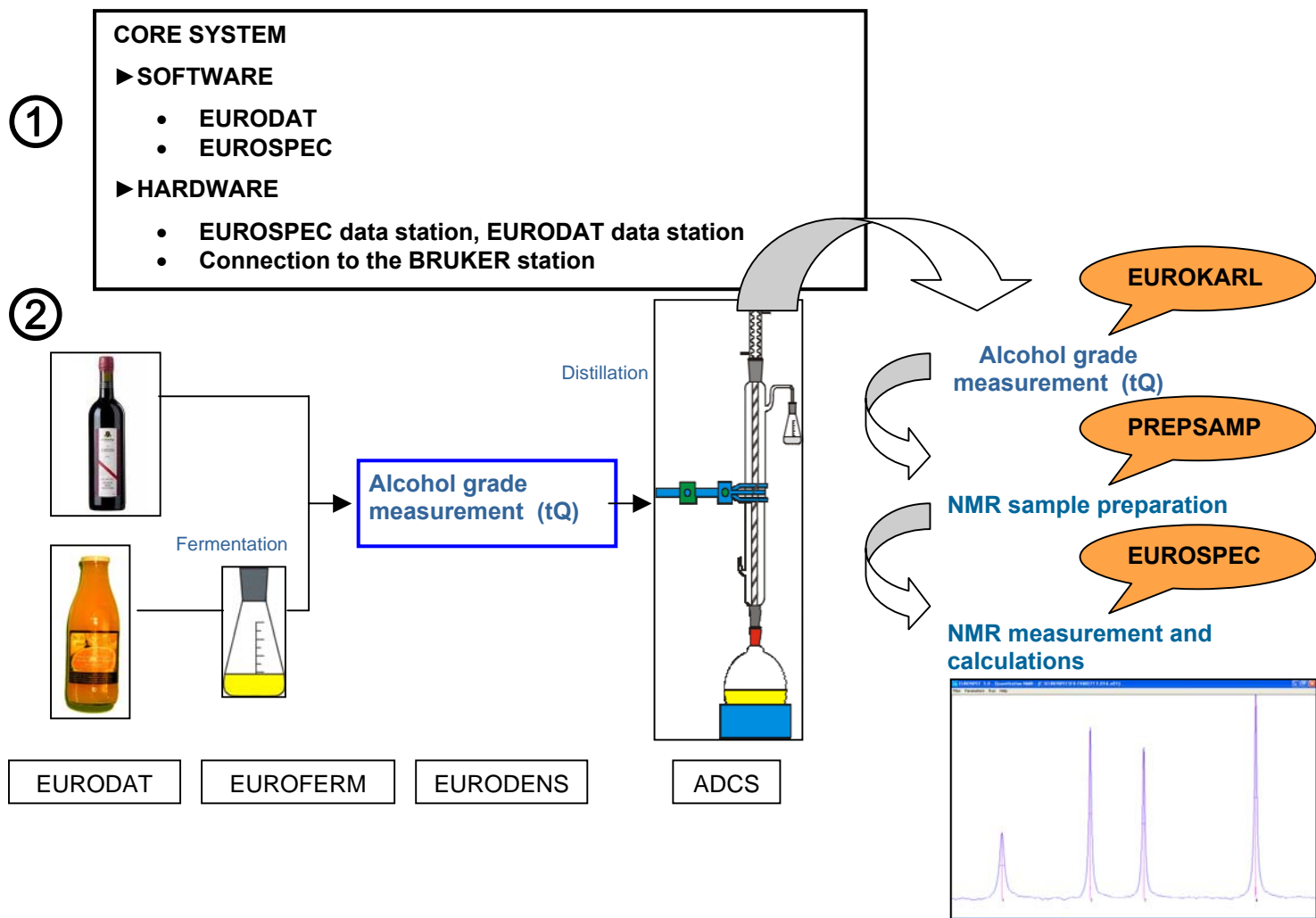
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The SNIF-NMR[®] Concept

The SNIF-NMR[®] Concept[®] includes:

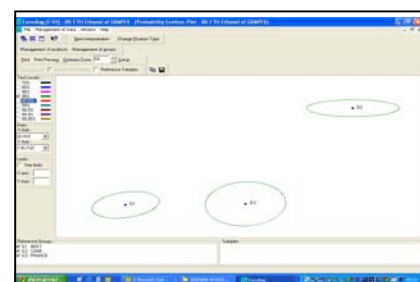
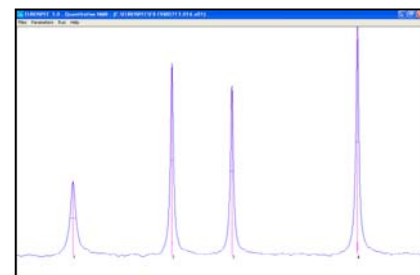
- ① A **CORE SYSTEM** made up of the EURODAT and EUROSPEC modules.
 - **EURODAT** as a LIMS, is a data management system providing a link to all the other modules – from sample login through the preparation and measuring steps to delivery of an analytical report.
 - **EUROSPEC** provides on-line automated isotopic ratio ($^2\text{H}/^1\text{H}$) calculations.
- ② A **SAMPLE PREPARATION** module that includes all the stages needed to prepare the sample for ^2H NMR measurement.
- ③ AN **INTERPRETATION MODULE** – **EURODIAG** - to evaluate a sample against a reference grid built up from results on authentic samples



Available versions

Different versions are available depending on the product to be analysed:

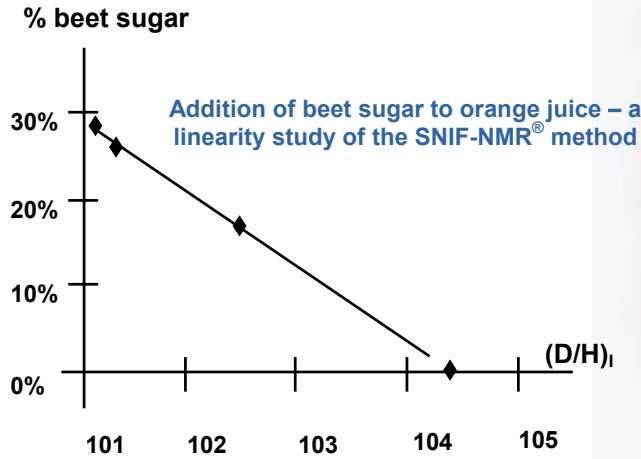
- **Wines and spirits**
- **Fruit juices**
- **Honey**
- **Sugars**
- **Vanillin**
- **Benzaldehyde**
- **Anethole**
- **Acetic acid (vinegar)**
- **Other (on request)**



Fruit Juice authenticity testing

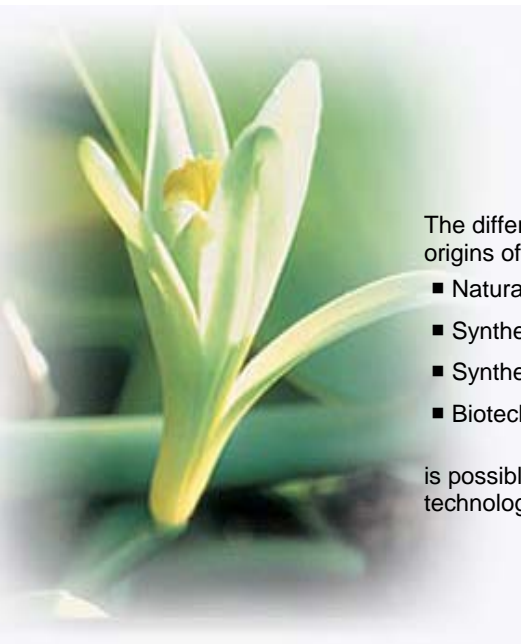
SNIF-NMR[®] can be used to detect undeclared addition of exogenous sugar.

SNIF-NMR[®] parameters are included in the AIJN (European Fruit Juice Association) Code of Practice as authenticity criteria for fruit juices.



Authentication of natural flavours

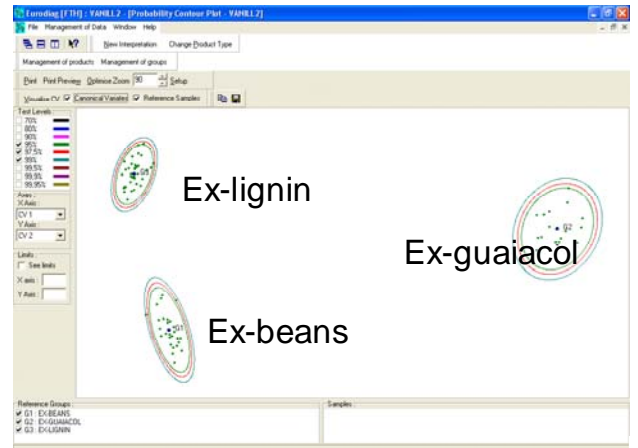
SNIF-NMR[®] enables verification of synthetic, natural biotechnological flavour



The differentiation between different origins of vanillin:

- Natural
- Synthetised from guaiacol
- Synthetised from lignin
- Biotechnological vanillin

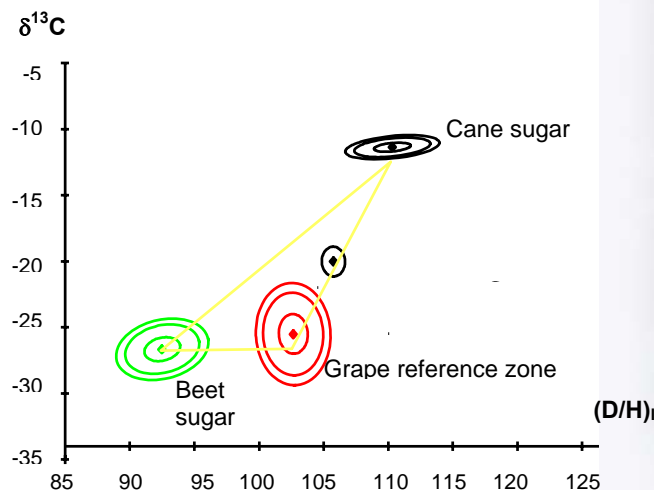
is possible using ²H-SNIF-NMR[®] technology.



Detection of wine chaptalisation

SNIF-NMR[®] is the official method for the detection of over enrichment or chaptalisation of wines (EC 2676/1990).

The method can also be used to control sugar addition in sweet wines. This application has been used by the sweet wine producers of the Anjou region in France to guarantee the authenticity of their produce.



Other applications include : botanical origin of alcohol in spirits, agricultural origin of bioethanol

Based on established experience

The SNIF-NMR[®] Concept was developed using the know-how built up over more than 20 years of involvement in ²H NMR spectroscopy of the chemical components of beverages and flavours. In addition to practical experience, Eurofins have built up a database of over 20 000 isotopic data for wine, fruit juice, natural flavours and other products. These are available as reference grids for the interpretation of SNIF-NMR[®] results.

Quality Assurance

Each module of the SNIF-NMR[®] Concept meets the requirements of EN ISO 17025. The systems enables full traceability of the SNIF-NMR[®] analyses, from the sample to the interpretation of results. It includes integrated control charts to ensure high quality measurements

Customer Support

Eurofins provides hands-on training in their laboratories for staff using the SNIF-NMR[®] Concept. Our SNIF-NMR[®] team will carry out the installation of the system in your own laboratories with on-site coaching and will accompany you at every step during the first year of use of the SNIF-NMR[®] Concept, ensuring measurement calibration and troubleshooting.



Eurofins runs the only proficiency testing scheme for isotope analyses, the FIT-PTS, to ensure high quality results from all users of the SNIF-NMR[®] system. Our experts regularly organise SNIF-NMR[®] workshops, together with Bruker and BEVABS, the European Community office in charge of the wine databank. These are ideal opportunities to meet other SNIF-NMR[®] users and keep up to date with the latest developments of the technique.

Eurofins Scientific

The SNIF-NMR[®] team is based at the Nantes site of the Eurofins Scientific Group. Eurofins is a world leader in food, pharmaceutical, cosmetic and environment testing, deploying a comprehensive range of state-of-the-art analytical techniques in order to support its clients' increasingly stringent quality and safety standards. The Group has built up a global network of laboratories and Competence Centres offering over 25 000 tests to establish the product safety, composition, authenticity, origin and traceability.

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