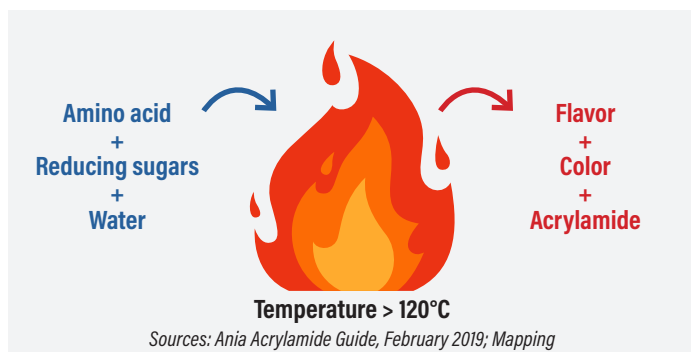


Fluorescence for More Accurate Acrylamide Analysis

Background

Thermal processes applied to foodstuffs are essential for developing organoleptic qualities (color, flavor, texture) and ensuring product safety. However, these processes can lead to the formation of so-called "**compounds**", resulting from complex reactions between sugars and amino acids naturally present in foods.

Acrylamide is one such compound. It forms primarily during high-temperature cooking of starchy foods, such as potato chips, cookies, or bread. Acrylamide is considered a contaminant of concern by health authorities due to its potentially harmful effects on human health.



Regulatory Framework



To limit consumer exposure, the European Union has adopted the **Regulation (EU) 2017/2158**, which establishes mitigation measures and sets reference levels for various foods.

In the case of **Potato chips produced from fresh tubers**; this indicative content is set at **750 µg/kg**.

These requirements mandate that manufacturers implement effective and rapid control measures that are adapted to production constraints.



Principles and Advantages of Fluorescence in Food Analysis

Fluorescence is based on a simple physical principle: when a molecule is excited by light of a certain wavelength, it returns to its stable state by emitting light of a different wavelength.

This emission constitutes a unique spectral fingerprint, directly linked to the chemical composition of the sample.

Spectralys analyzers exploit this property by collecting and analyzing these spectral fingerprints. Unlike more cumbersome analytical methods (such as chromatography), fluorescence provides a result **that is rapid, non-destructive, and requires no complex sample preparation.**

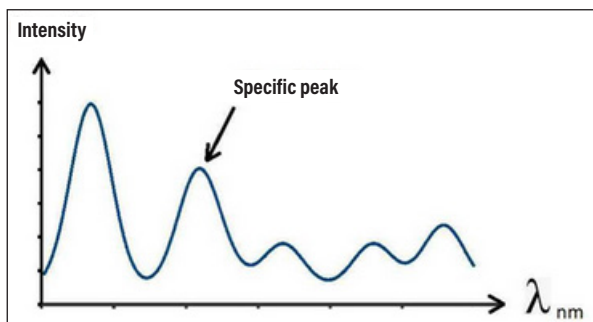


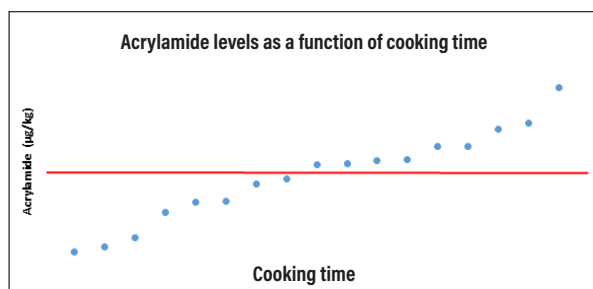
Illustration of a fluorescence spectrum

Monitoring acrylamide formation during cooking

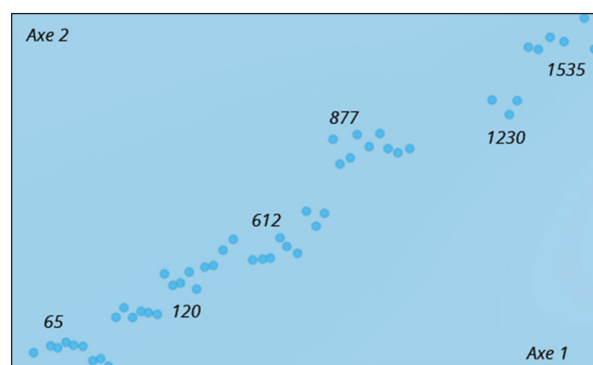
Acrylamide is a good indicator of the progression of browning reactions during cooking.

A study conducted on potato chips showed a **clear correlation between cooking time and the increase in acrylamide levels.** Spectral measurements obtained with **Fluoralys Solids** were compared to reference laboratory assays, confirming the robustness and validity of the method.

Fluorescence allows for real-time monitoring of the cooking process and rapid identification of conditions that could lead to regulatory thresholds being exceeded.



Acrylamide levels as a function of cooking time



Mapping of acrylamide levels

Why Choose Fluoralys?

By incorporating fluorescence into their quality control processes, food manufacturers gain access to a fast, effective, and non-destructive tool that ensures **food safety, compliance with European regulations, and the optimization of production processes.**

The Fluoralys Solids analyzer offers an innovative solution for controlling newly formed contaminants:

- **Ease of use:** Direct measurement on the finished product or after simple grinding, without any complex preparation.
- **Advanced statistical analysis: Principal Component Analysis (PCA)** applied to spectra highlights the different acrylamide levels and allows for the mapping of concentrations.
- **Predictive modeling: Using** based on constructed spectral databases, Fluoralys provides a rapid and reliable estimate of acrylamide levels.
- **Process Control:** By providing real-time monitoring, the device helps adjust cooking conditions and optimize manufacturing processes.