

## **Characterization of Gelation Kinetics of Gelatin Using Fluorescence Spectroscopy**

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Select components of food, including many colorants, can be employed as intrinsic and generally recognized as safe (GRAS) luminescent probes of food quality and safety attributes. This study seeks to identify potential GRAS optical probes that can be used to monitor the formation and properties of gelatin gels using rapid, noninvasive, and sensitive optical fluorescence techniques.

Fluorescence kinetics studies were conducted using the GRAS chromophore Fast Green (FD&C Green No. 3). Fluorescence intensity was monitored at peak emission wavelength over time during formation of gelatin gels with concentrations ranging from 0.01% to 6% (wt/vol). Fluorescence spectroscopy measurements were corroborated with the standard analytical technique of circular dichroism spectroscopy in order to identify whether the formation of triple helices in the process of gelation is detected by the fluorescence kinetics studies.

Interpreting the luminescent signals of GRAS chromophores to provide insight into the microenvironment of food systems provides a unique opportunity to expand the repertoire of analytical techniques in the food industry. This analytical technique can be implemented at various stages in food production and distribution as an intrinsic, inexpensive, and environmentally conscious method to monitor quality and stability of food gels. Specific potential applications may include, but are not limited to, improved quality assurance of gummy candies, pre-packaged gelatin desserts, and pharmaceutical products. By applying these probes to characterize gelation, this study works to transition the functionality of this new analytical technique from simple solutions to more complex food systems.