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Swift Detection of Sulfite Residue in White Wine through a Multichannel Colorimetric Nanozyme Sensor

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Introduction

The preservation of wine quality is a paramount concern for winemakers and consumers alike. Among the various factors influencing wine quality, the presence of sulfite residues has garnered significant attention. Sulfites, commonly used as preservatives in winemaking, can provoke adverse reactions in individuals with sulfite sensitivity and may contribute to the deterioration of wine flavor over time [1]. Hence, rapid and precise detection of sulfite residue in wine is of critical importance. This study introduces an innovative approach to address this concern, employing a multichannel colorimetric nanozyme sensor for the swift and accurate detection of sulfite residues in white wine. Sulfite detection methods have historically been complex, time-consuming and often require specialized equipment. The advent of nanotechnology and the emergence of nanozymes-nanomaterials with enzyme-like catalytic properties-have opened new avenues for rapid and sensitive detection. Leveraging these advancements, we present a novel nanozyme-based sensor that not only streamlines the detection process but also enhances the precision of sulfite quantification in white wine [2].

Description

The multichannel colorimetric nanozyme sensor designed for sulfite detection in white wine is a testament to the convergence of cutting-edge technology and the culinary arts. The sensor's core components consist of nanozymes that catalyze the conversion of sulfite ions into a detectable color change. By harnessing the catalytic power of nanozymes, this sensor offers a rapid and reliable means of quantifying sulfite residues in white wine. The sensor operates on a simple yet ingenious principle [3]. When exposed to white wine containing sulfite residues, the nanozymes within the sensor facilitate a reaction that transforms sulfite ions into a distinct color signal. This color change is quantifiable, allowing for the precise determination of sulfite concentration. The sensor's multichannel design accommodates various white wine samples, providing flexibility for both consumers and industry professionals. Furthermore, the nanozyme-based sensor boasts several advantages over traditional sulfite detection methods [4]. It eliminates the need for cumbersome laboratory equipment and reduces the time required for analysis, enabling real-time testing in wineries, restaurants and even at home. Its high sensitivity and accuracy ensure that even trace amounts of sulfites can be detected, contributing to the preservation of wine quality and the protection of sulfite-sensitive individuals [5].

Conclusion

In conclusion, the swift and accurate detection of sulfite residue in white wine is paramount to maintaining wine quality and ensuring the safety of consumers. The multichannel colorimetric nanozyme sensor presented in this study represents a significant advancement in this endeavor. By harnessing the catalytic prowess of nanozymes, this sensor offers a streamlined and precise solution to sulfite detection, revolutionizing the way we monitor sulfite levels in white wine. The potential applications of this technology extend beyond winemaking, encompassing a wide range of industries where sulfite monitoring is crucial. As we embrace innovation and the possibilities offered by nanotechnology, we pave the way for more efficient, accessible and accurate methods of chemical detection. This sensor serves as a testament to the marriage of science and gastronomy, where technology enhances our enjoyment of one of the world's oldest and most cherished beverages while promoting quality and safety.

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Conflict of Interest

There are no conflicts of interest by author.

References

1. Maiti, Biplab K. "Cross-talk between (hydrogen) sulfite and metalloproteins: Impact on human health." *Chem Eur J* 28 (2022): e202104342.
2. Jiang, Lirong, Tianhong Chen, Erwang Song and Ying Fan, et al. "High-performance near-infrared fluorescence probe for fast and specific visualization of harmful sulfite in food, living cells and zebrafish." *Chem Eng J* 427 (2022): 131563.
3. Jahani, Peyman Mohammadzadeh, Hadi Beitollahi and Somayeh Tajik. "Surface amplification of graphite screen printed electrode using reduced graphene oxide/polypyrrole nanotubes nanocomposite; A powerful electrochemical strategy for determination of sulfite in food samples." *Food Chem Toxicol* 167 (2022): 113274.
4. Devaramani, Samrat, K. Suresh Kumar, B. P. Suma and M. Pandurangappa. "Rhodamine B phenylhydrazide as a new chemosensor for sulfite quantification: Application to food samples." *Mater Today Proc* 49 (2022): 748-755.
5. Zhang, Jin, Chenyang Yue, Yingjun Ke and Hemi Qu, et al. "Fluorescent probes for the detection of biogenic amines, nitrite and sulfite in food: Progress, challenges and perspective." *Advanced Agrochem* (2023).

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