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## OP9 : FLOW ANALYSIS METHOD FOR HYDROXYPROLINE DETERMINATION TO ASSESS COLLAGEN CONTENT IN FISH SKIN

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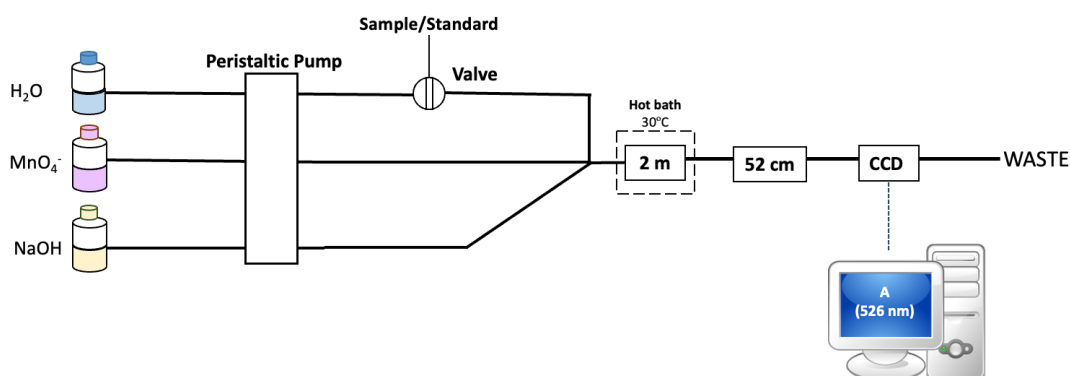
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### ABSTRACT

Collagen is a protein with several applications, with weak antigenicity, low toxicity, and high nutritional value. Usually, it is extracted from bovine skin but a project was designed proposing an alternative to extract collagen from fish skin. This alternative was tested by assessing the collagen content in fish skin based on the determination of hydroxyproline (HYP), one of the most abundant amino acid present in collagen (Sotelo et al., 2016). Therefore, the determination of HYP requires the hydrolysis of the fish skin, to break collagen in its amino acids, and the HYP value quantified relates to the collagen content. This was previously assessed to be 38 µg of HYP per mg of pure collagen.

In this context, the aim of the described work was to develop an automatic method based on flow injection analysis approach to determine HYP. The determination was based on the redox reaction with permanganate (Farokhi et al., 2002) and the consequent decrease of colour intensity registered. The best conditions for the determination were studied, namely, reagent concentration, sample volume, flow rate and reaction time. The developed method enables the determination of the HYP in a faster, simpler and accurate way, with less toxic solutions.



**Keywords:** Flow injection analysis; Hydroxyproline; Permanganate; Blue shark

### References

- Farokhi, S. A., Kini, A. K., & Nandibewoor, S. T. (2002). Oxidation of l-Hydroxyproline by Aqueous Alkaline Permanganate--A Kinetic Study. *Inorganic Reaction Mechanisms*, 4(1–2), 67–76.
- Sotelo, C. G., Blanco Comesaña, M., Ramos Ariza, P., & Pérez-Martín, R. I. (2016). Journal of Aquatic Food Product Technology Characterization of Collagen from Different Discarded Fish Species of the West Coast of the Iberian Peninsula. *Journal of Aquatic Food Product Technology*, 25(3), 388–399.

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