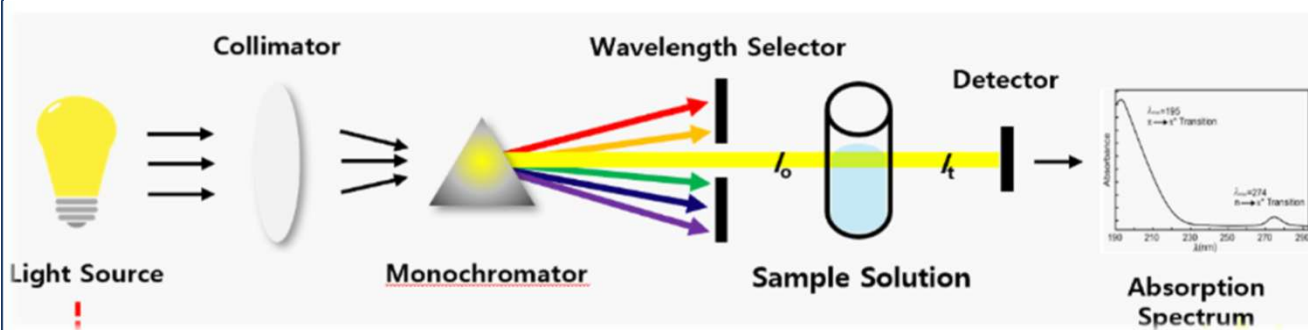


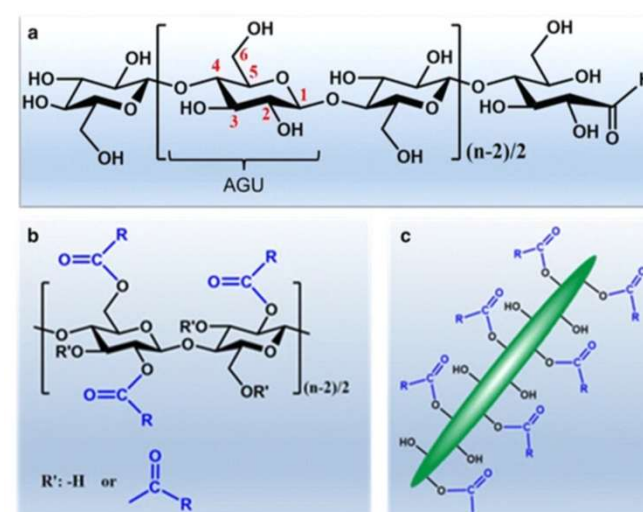
Introduction

UV-Vis spectrophotometry makes it possible to identify the concentration of a solution as a function of the absorption of electromagnetic radiation. A sample is susceptible to evaluation if it contains chromophore groups, e.g. methylparaben (MeP).



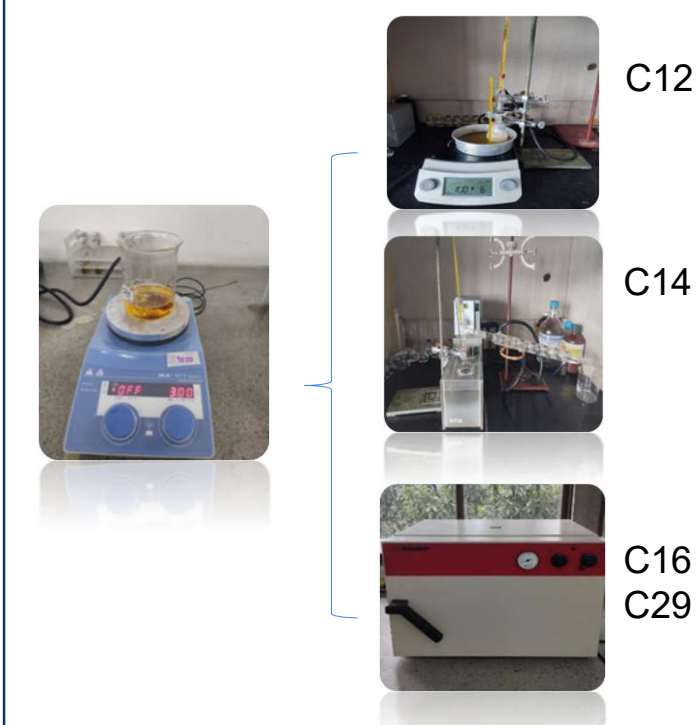
MeP is an ester of p-hydroxybenzoic acid. Its presence in water poses a health risk due to its high degree of adsorption on the skin. It is considered an emerging pollutant and endocrine disruptor, i.e., it mimics cell receptors, causing breast and prostate cancer and reproductive problems.

As a strategy to remove parabens from water, cellulose, extracted from agricultural waste and plant material, is being used to modify cellulose and generate materials with high selectivity as adsorbents to retain adsorbates such as MeP in efficient and widely used processes such as adsorption.



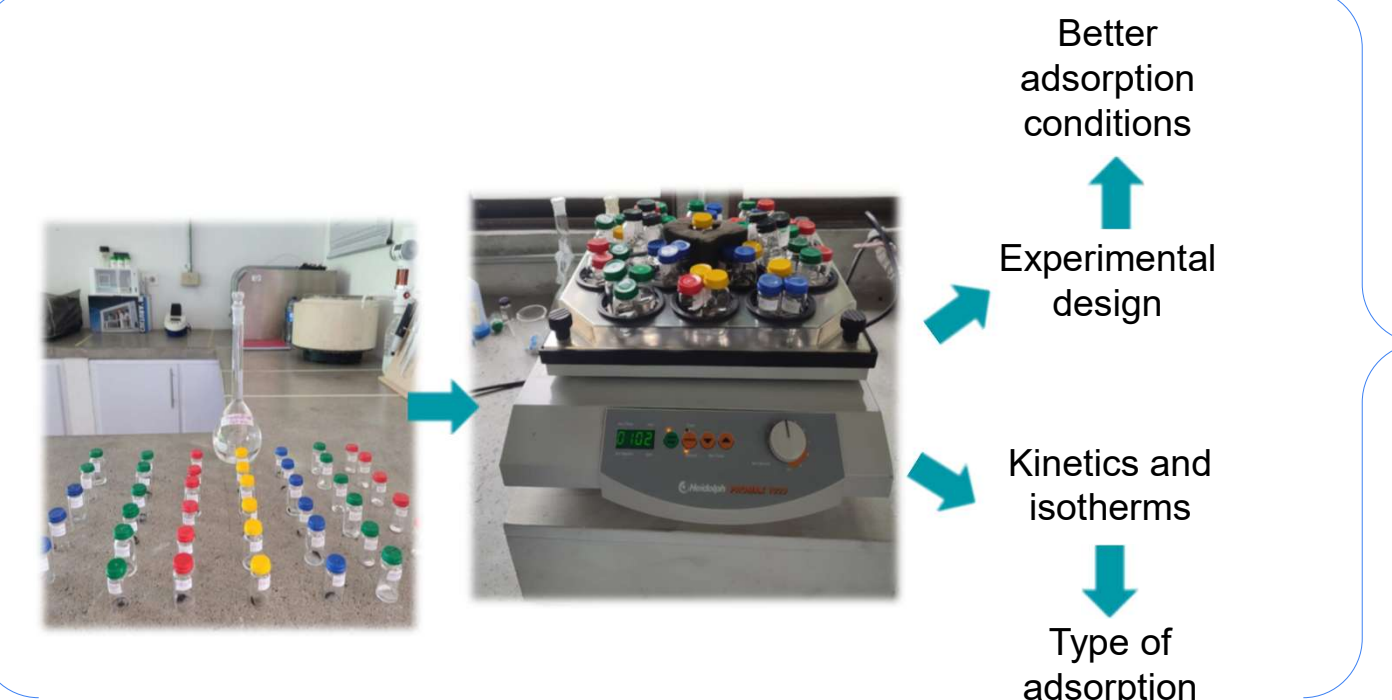
The following is a general presentation of how the validation of a spectrophotometric method for the measurement of methylparaben allows the selection of the best chemical modification methodology among 4 cellulose modified materials, the evaluation of the best adsorption conditions and the type of adsorption of methylparaben on cellulose modified materials with organic acids.

Methodology



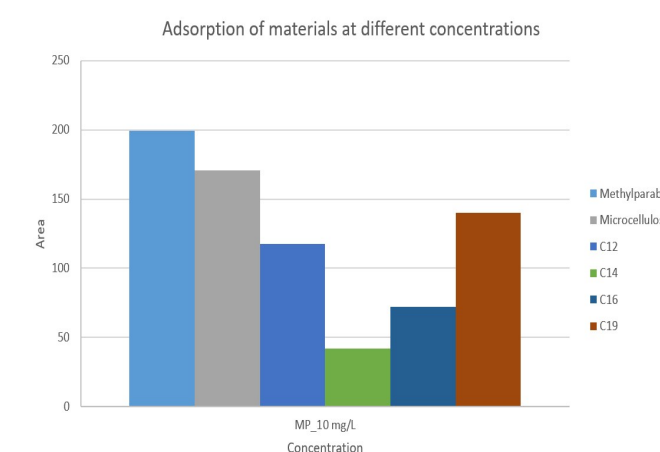
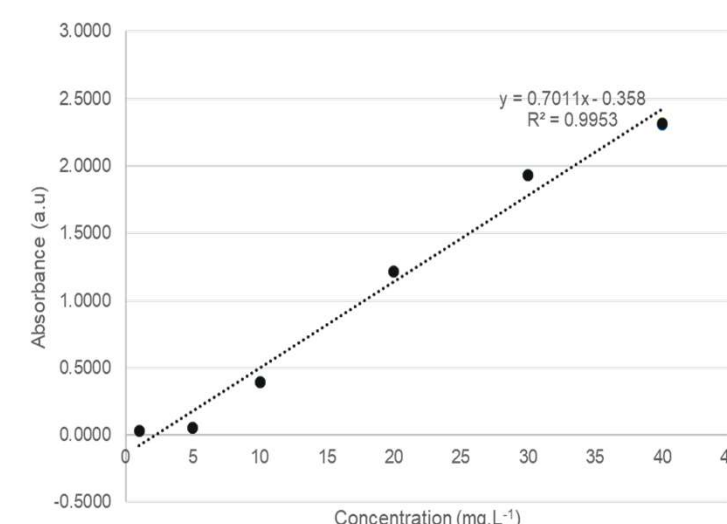
Validation

CMR Merk PHR1012-1G



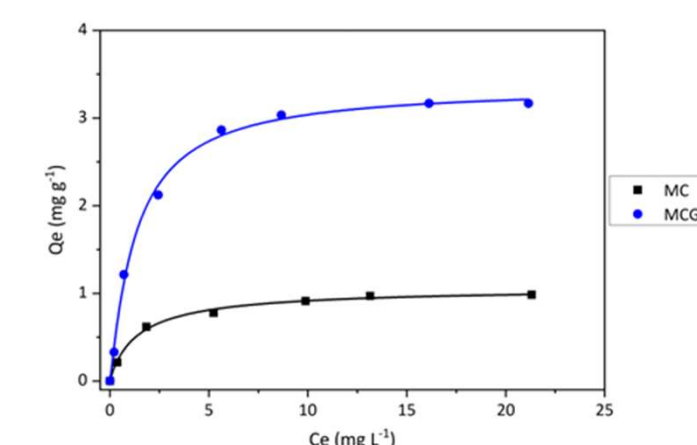
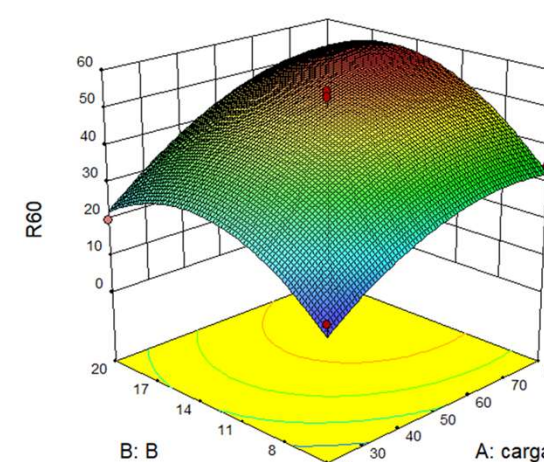
Results

0.998 mg.L⁻¹ to 30 mg.L⁻¹



C14 is the best material and corresponds to a modification of cellulose with gallic acid.

The ideal adsorption process is affected by pH changes.



Adsorption isotherm conforming to the Langmuir model. Physisorption.

Acknowledgments

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Conclusions & Recommendations

A method was developed to measure methylparaben in water by UV-Vis spectrophotometry traceable to the SI, suitable for the evaluation of cellulose modified materials, with removals close to 80% using gallic acid. It was established that pH is a determining factor in the adsorption process of MeP with cellulose modified materials, above the adsorbent loading. It was shown that the Langmuir model efficiently explains the adsorption of MeP on C14 by physisorption. The development and implementation of CMR and spectrophotometric methods in the evaluation of adsorption-modified materials is feasible.