



150 ANOS PARA 118 ELEMENTOS A TABELA PERIÓDICA

XXVI ENCONTRO NACIONAL

DA SOCIEDADE PORTUGUESA DE QUÍMICA

24, 25 E 26 DE JULHO DE 2019
FACULDADE DE CIÊNCIAS DA UNIVERSIDADE DO PORTO



ANO INTERNACIONAL
DA TABELA PERIÓDICA



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Livro de Resumos

24, 25 e 26 de julho de 2019

Faculdade de Ciências – Universidade do Porto

Titulo

Livro de resumos do XXVI Encontro Nacional da Sociedade Portuguesa de Química

Editores

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Edição

Sociedade Portuguesa de Química

Design gráfico

Emotive Design | Tiago Marques

Montagem

Comissão Organizadora do XXVI ENSPQ

Data

Julho de 2019

ISBN

978-989-8124-27-2 (edição digital)

Catálogo recomendada

Livro de resumos do XXVI Encontro Nacional da Sociedade Portuguesa de Química
Faculdade de Ciências, Universidade do Porto, 2019 – 450 p.
ISBN 978-989-8124-28-9
Química – Congressos

O presente livro foi produzido a partir dos trabalhos submetidos diretamente pelos autores. Foram apenas introduzidas pequenas alterações de edição que de modo algum modificaram os conteúdos científicos. O modelo final de impressão foi estabelecido para o XXVI Encontro Nacional da Sociedade Portuguesa de Química de acordo com as normas divulgadas publicamente nos anúncios do evento. A responsabilidade dos conteúdos científicos é dos respetivos autores.

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Materials

Development of Double Emulsions from *Sambucus nigra* L. Berry Extract as pH Stable Colorant Formulations

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Anthocyanins are flavonoids, one of the largest groups of water-soluble vegetable pigments, having also sweetening and antioxidant properties. They are characterized by different colors, such as red, purple, blue and violet. However, their color stability is compromised by variations in pH, temperature, moisture, and luminosity conditions.¹ The berries of *Sambucus nigra* L. have high contents of anthocyanins (cyanidin-3-O-sambubioside and cyanidin-3-O-sambubioside-5-O-glucoside), being a promising option as food coloring agents.² Therefore, this work aims to stabilize the natural hydrophilic colorant obtained from *S. nigra* through the preparation of double emulsions (water/oil/water, W/O/W). The *S. nigra* berries were extracted by crushing the fruits to obtain the juice, followed by spray drying to obtain the dry extract. For the preparation of the double emulsions, the procedure was the one described by Paula D. A. *et al.* with some modifications.³ Briefly, for the first emulsion, the water phase comprised 55 mg/L of the extract and 5% Polyglycerol polyricinoleate (PGPR), homogenized under stirring (20000 rpm, 5 min). This phase was dispersed into corn oil at a W/O ratio of 0.4. (**Figure 1 – (A)**). Thereafter, the second emulsion was prepared by dispersing the previous emulsion in a water phase comprising Tween 80 and gum Arabic, tested at different concentrations. The final W/O/W emulsion was prepared at different primary emulsion/water ratios and stirred at 6000 rpm during 2 min using an Ultra-Turrax system. The produced emulsions were analyzed by optical microscopy (OM) using a Nikon eclipse 50i microscope to assess size and morphology. This analysis showed the presence of spherical and individualized droplets with an estimated particle size between 13 and 16 μm . (**Figure 1 – (B)**). The role of these emulsions as pH stable colorants were tested using different buffers (pH 4-7), as shown in (**Figure 1-(C)**), which also presented the comparison with solutions prepared from the original *S. nigra* extract. The obtained results pointed out for an improved stability and color homogeneity among samples in the tested pH range.

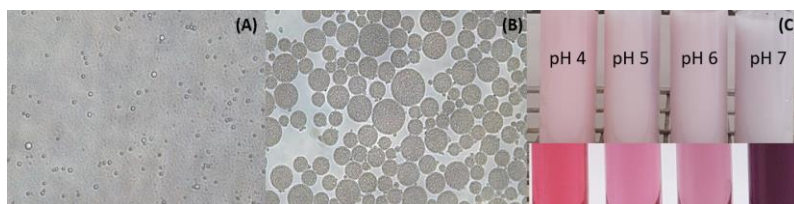


Figure 1: (A) Simple Emulsion, and (B) Double emulsion, and (C) Testing at different pHs (4-7).

Acknowledgements: Associate Laboratory LSRE-LCM (UID/EQU/50020/2019) funded by national funds through FCT/MCTES (PIDDAC) and FCT, and CIMO (UID/AGR/00690/2019) through FEDER under Program PT2020. To project Valor Natural (Norte-01-0247-FEDER024479) through FEDER under Program PT2020. To the national funding by FCT, P.I., through the institutional scientific employment program-contract for L. Barros and I.P. Fernandes contract.

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