9 PYCheM
Portuguese Young Chemists Meeting

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BOOK OF ABSTRACTS

9TH PORTUGUESE YOUNG CHEMISTS MEETING

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OC21. Preparation and Characterization of Adsorbents from Waste Biomass for Estrogen Removal Through Adsorption

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The environmental impact associated with socioeconomic development is currently a major challenge [1]. One concern relates to inadequate waste disposal of micropollutants, such as endocrine disruptors, which consist of substances with harmful effects even in very low concentrations (µg/L or ng/L) [2], namely natural estrogenic hormones E1, E2 and E3, and synthetic estrogenic hormone EE2, which chemical structures are presented in **Figure 1**.

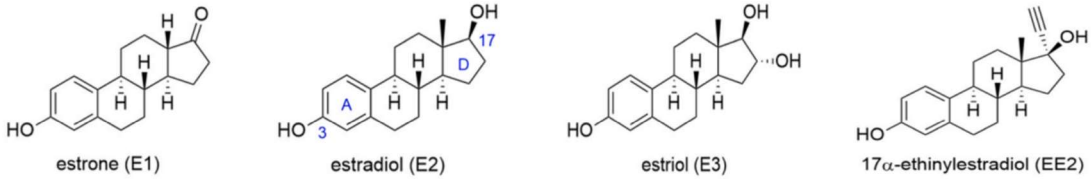

Figure 1: Chemical structure of relevant estrogens [3].

Adsorption has been proven as the most promising removal method of micropollutants, with the preparation of adsorbents with well-defined microporous structures and rich amounts of surface chemical groups as an important step [4]. Almond shell and cork were selected as potential adsorbents for estrogen removal due to their availability and characteristics. Carbonization of these materials occurred at 550°C for 1 h, achieving activation yields of 22.33%wt. and 15.81%wt., respectively. Surface chemical groups were quantified for the "in natura" and carbonized materials. The results are presented in **Figure 2**.

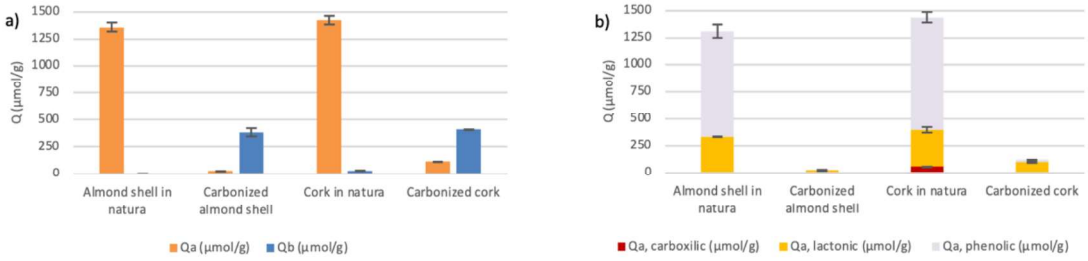

Figure 2: a) Quantification of acidic and basic sites; b) Characterization of acidic sites.

Results show that the "in natura" adsorbents are acidic, with phenol as the dominant acidic group. Carbonization changes the prevalence from acidic to basic groups for both adsorbents.

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