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Activated carbon synthesis using sugarcane bagasse for electrochemical applications

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Hydrogen peroxide (H_2O_2) is one of the most used oxidants [1]. Electrochemical technology allows the synthesis of H_2O_2 in an aqueous medium, but it is necessary to study the electrodic material to direct the reduction of O_2 by 2-electron mechanism. In this sense, the present work aimed to study the synthesis of active carbon, for application in the generation of H_2O_2, using sugarcane bagasse with activator KOH and NaOH. For the synthesis of carbon, the process of calcining sugarcane bagasse was used in the presence of an activating solution (different proportions KOH:NaOH) at temperatures ranging from 400 °C to 900 °C for up to 120 minutes. Each material was electrochemically characterized using the porous micro-layer technique on a rotating disc-ring electrode using linear sweep voltammetry in 0.05 mol L^{-1} K_2SO_4 electrolyte pH 3 saturated with O_2, according to the methodology described in the literature. The best materials were characterized by XPS, FEG, DRX and BET. The main results demonstrated that the electrochemical activity of the synthesized materials is associated with the influence of the temperature associated with the presence of the activating solution, achieving maximum electrochemical activity for the generation of H_2O_2 (detection on the Pt ring) at 650 °C for 60 minutes using 10% activation solution. Regarding activation, the results demonstrated that the combined use of NaOH and KOH (in different proportions) did not promote significant improvements in the materials, with the material using 100% NaOH presenting the best results for H_2O_2 generating.

Acknowledgments:
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References:

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