PÔSTER - RESUMO - DISPOSITIVOS ELETRÔNICOS, ELETROQUÍMICOS, SUPERCAPACITORES E BATERIAS

FABRICATION OF INTERDIGITATED ELECTRODES BY PHOTOLITHOGRAPHY

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Fabrication of Interdigitated Electrodes by Photolithography

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Abstract

Interdigitated devices (IDEs) are widely employed in resistive and capacitive sensors due to their high sensitivity, geometric simplicity, and ease of integration with different active materials. These devices are particularly relevant in applications involving graphene-based materials in organic electronics and are frequently used in chemical, biological, and environmental sensors.

In this work, the fabrication of interdigitated electrodes using a conventional photolithography process is presented. A commercial negative photoresist kit (Negative Photoresist Kit, Sigma-Aldrich) was employed and applied to previously cleaned substrates. The choice of a negative photoresist is justified by its good resolution and stability during subsequent processing steps.

The photolithographic process involved the deposition of the negative photoresist by spin coating, ensuring the formation of a uniform film on the substrate. This was followed by a pre-bake step aimed at removing residual solvents and improving film adhesion. Ultraviolet radiation exposure was carried out through a photomask containing the interdigitated pattern, promoting photoresist crosslinking in the exposed regions. After development, the exposed areas remained on the substrate, acting as a protective mask during the selective chemical etching of the aluminum layer in the unprotected regions. Finally, the remaining photoresist was removed, resulting in the final definition of the interdigitated structure.

The fabricated devices exhibited good reproducibility, high geometric control, and well-defined metallic tracks, which are essential characteristics for applications in sensors and microelectronic devices. The results demonstrate that photolithography is a well-established, reliable, and efficient technique for

the fabrication of IDEs, being particularly suitable for experimental applications in microfabrication and electronics.

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Palavras-chave: interdigitated electrodes; photolithography; negative photoresist; sensors; microfabrication.