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POS-44 - Synthesis Strategies for Nanostructured Allotropes of Carbon

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ABSTRACT: In recent years, nanostructured carbon allotropes have received considerable attention for their potential applications in variety of fields, including but not limited to nanoelectronics, flexible electronics, gas and chemical sensors, power conversion and storage devices, just to name a few. Their outstanding physical properties, chemical stability and the ability to engineer their charge mobility are the main drivers for this widespread interest. However, various applications require structures with different building blocs, which necessitates development of specific strategies for their selective growth, with excellent control over the size, electrical, mechanical and optical characteristics. Moreover, some applications, particularly those related to nanoelectronics and NEMS, will require doping of these molecular structures with various dopants in order to modify their electrical properties.

There is variety of techniques used for fabrication of allotropes of carbon nanostructures. Plasma- and vacuum assisted synthesis techniques have been used as a strategy to assist the synthesis at lower temperatures, since plasma-assisted dissociation of precursors, facilitate the nanomaterial growth at lower temperatures [1,2]. Plasma techniques have also been used to dope graphene and CNT with nitrogen [3], an important step for nanoelectronic applications. In this presentation we will discuss various synthesis strategies and their specific advantages. We will also present characteristics of some samples produced from different techniques, and finally will present an example of applications related to energy production using thermionic converters [4].

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