Analysis of plant latex in nanomaterial synthesis

CLAURE NAIN LUNARDI, PhD, Laboratory of Photochemistry and Nanobiotechnology, University of Brasilia, Brazil
MIRELLA PAULA FREITAS BARROS, BSc, Laboratory of Photochemistry and Nanobiotechnology, University of Brasilia, Brazil
IGOR ALBUQUERQUE DE SOUZA PhD, Laboratory of Photochemistry and Nanobiotechnology, University of Brasilia, Brazil
ANDERSON DE JESUS GOMES PhD, Laboratory of Photochemistry and Nanobiotechnology, University of Brasilia, Brazil

Abstract

Statement of the Problem: Nanotechnology is an interdisciplinary field that involves the design, manipulation, and engineering of materials at the nanoscale, typically ranging from 1 to 100 nanometers in size. Among the various types of nanomaterials, metal nanoparticles are particularly interesting due to their unique optical, electronic, and catalytic properties that differ from their bulk counterparts[1-3]. Metal nanoparticles have been extensively studied and applied in various fields, including biomedicine, sensing, energy, and environmental remediation[4].Recently, advanced synthetic strategies, such as bottom-up and top-down approaches, have been developed to prepare metal nanoparticles with precise control of size, shape, and composition, allowing for tailoring of their properties for specific applications.[5]. Latex can be an economically viable alternative to other methods for creating metal nanoparticles due to its low cost, high availability, and ability to be easily scaled up for large-scale production. Unlike traditional methods that often require expensive and hazardous reagents and solvents, latex is a water-based dispersion of polymer particles that can serve as both a reducing agent and stabilizing agent for the formation of metal nanoparticles. Methodology & Theoretical Orientation: The bibliographical map was created using a binary term count method, selecting terms that appeared at least 8 times out of 3,962. This process identified 100 qualifying terms, and 60 were chosen based on these criteria. These terms were grouped into three clusters: one focused on polymers (red clusters), another on detection methods, demonstrated by the words “kit” and “systems” (clusters green), and the third on metal particles (blue clusters). Interestingly, there was no direct connection found between the metal particles cluster and the only metal nanoparticle detected, which was silver nanoparticles (AgNP).Conclusion & Significance: The findings highlight the prominence of *Euphorbia latex* in patents and applications, underscoring the potential of these natural compounds in various industries.

Image

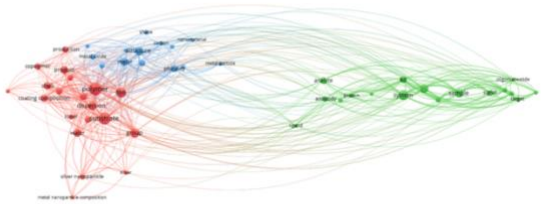


Figure 1: Bibliometric analysis of nanoparticles synthesis from plant latex

Recent Publications

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Photograph



Biography

Claure Nain Lunardi is an associated professor in organic chemistry, enthusiast researcher leading undergraduate and graduate students in chemistry, nanomaterials, and photochemistry at University of Brasília since 2008. She obtained her Chemistry BSc. (1996), followed by her Chemistry Master and Ph.D. from University of São Paulo (USP-RP) on the synthesis and photochemistry of phthalocyanines for photodynamic therapy (2004). She completed a postdoctoral fellowship at Pharmacy School at USP-RP (2008) in general pharmacology focused on nitric oxide donors. Claure was a visiting researcher at Columbia University (2013-2014) at Biomedical Engineering. Her work has been published in Materials Science and Engineering C, Nitric Oxide - Biology and Chemistry, Vascular Pharmacology and Canadian Journal of Chemical Engineering. Her current research interest lies in graphene, gold nanoparticles-based nanomaterials such as photocatalysis and drug delivery systems.

Email:clunardi@unb.br

Notes/Comments