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Nanomaterials Derived from Fungal Sources-Is It the New Hype? (Review)

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Abstract

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Greener alternatives to synthetic polymers are constantly being investigated and sought after. Chitin is a natural polysaccharide that gives structural support to crustacean shells, insect exoskeletons, and fungal cell walls. Like cellulose, chitin resides in nanosized structural elements that can be isolated as nanofibers and nanocrystals by various top-down approaches targeted at disintegrating the native construct. Chitin has, however, been largely overshadowed by cellulose when discussing the materials aspects of the nanosized components. This Perspective presents a thorough overview of chitin-related materials research with an analytical focus on nanocomposites and nanopapers. The red line running through the text emphasizes the use of fungal chitin that represents several advantages over the more popular crustacean sources, particularly in terms of nanofiber isolation from the native matrix. In addition, many β-glucans are preserved in chitin upon its isolation from the fungal matrix, enabling new horizons for various engineering solutions.

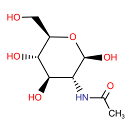
SciVal Topic Prominence

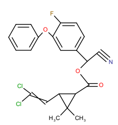
Topic: Chitin | Nanowhisker | Vibrissa

Prominence percentile: 94.327

Chemistry database information

Substances





β-glucan

chitin

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Engineering controlled terms: Cellulose | Fungi | Nanofibers

Engineering uncontrolled terms: Engineering solutions | Materials research | Nanosized components | Natural polysaccharide | Structural elements | Structural support | Synthetic polymers | Top down approaches

Engineering main heading: Chitin

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EMTREE drug terms: beta glucan · cellulose · chitin · nanocomposite · nanocrystal · nanofiber · nanomaterial · polymer

EMTREE medical terms: chemical structure · fungus · mycelium · nonhuman · packaging · priority journal · Review

PaperChem Variable: Cellulose · Chitin · Engineering · Fungi · Isolation · Materials · Sources · Synthetic Polymers

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