عنوان مقاله:

Production of Materials with High Thermal Insulation from Natural Fibers and Sericin

محل انتشار:

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خلاصه مقاله:

Silkworm cocoon is a natural biological and composite structure that has evolved over time and has high physical and mechanical properties against stress and acts as insulation against ambient temperature conditions. Understanding the relationships between the two-component structure of silkworm cocoons (sericin and fibroin) inspires the creation of composite structures, including lightweight, high-strength nonwoven biocomposites. In the present study, by analytical-descriptive method, we have tried to use cocoon sericin and introduce some famous and widely used natural fibers in materials science and study their characteristics - because for various reasons such as lightness, lack of pollution and low cost, etc. can be suitable alternative for a replacement of synthetic fibers - suggest the production of non-woven bio-composite materials. Natural fibers such as jute, hemp, flax, etc. with different volume percentages in combination with sericin as a binder, were proposed for this biocomposite and the thermal performance of each of them was compared using Maxwell's theoretical model. All compounds show low thermal conductivity and jute-sericin biocomposite with ۷۰% by volume and ۰.۰۶۱ W/m۲-K performance has better performance.

کلمات کلیدی:

biocomposite, Biomimicry, Bionic architectural materials, Natural fibres, silkworm cocoon