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Influence of agro - based reinforcements on the properties of aluminum matrix composites : a systematic review

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Department of Manufacturing and Materials Engineering, International Islamic University Malaysia, Kuala Lumpur, 53100, Malaysia

[Abstract](#)[Reaxys Chemistry database information](#)[Indexed keywords](#)[SciVal Topics](#)[Funding details](#)**Abstract**

Aluminum matrix composites (AMCs) have been extensively studied primarily due to higher strength-to-weight ratio, lower cost, and higher wear resistance properties. However, increasing demand for economical and energy-efficient materials in the automotive, aerospace and other applications is tailoring research area in the agro - based composite materials. Therefore, the aim of this systematic review work is to study the influence of agro - based reinforcements on the tribological and mechanical properties of AMC's processed by various techniques. It was observed that the processing conditions can be designed to obtain uniform structures and better properties AMCs. The agro -waste reinforcement materials, such as rice husk ash, bamboo stem ash, coconut and shell ash can result in a reduction in the density of AMC's without compromising mechanical properties. Moreover, the efficient utilization of the agro -waste leads to a decrease in manufacturing cost and prevents environmental pollution, hence, can be considered as a sustainable material. The state-of-the-art revealed that the agro - based reinforcements do not form brittle composites, as in the case of ceramic reinforced composites. Hence, the study concludes that the agro - based AMCs have great potential to act as a replacement for costly and environmentally hazardous ceramic reinforced-AMCs which can especially be used in various automotive applications that demand higher strength-to-weight ratio, lower cost, and higher wear resistance. Graphical abstract: [Figure not available: see fulltext.] © 2021, The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature.

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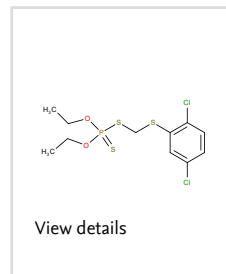
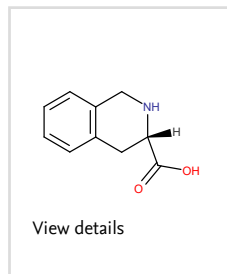
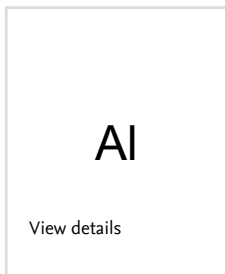
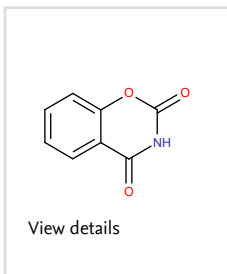
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