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# Production and molding of full and partial bio-based poly aryl ether ketone composites as new performance super engineering plastics

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## Résumé

Bio-based materials are popular because of their sustainability, lower carbon footprint, biodegradability, low toxicity, and innovative applications. Besides, the use of biobased materials reduces dependence on fossil fuels, conserves natural resources, and helps mitigate climate change. To reduce the dependence on petrochemicals and make full use of renewable resources, there has been a surge in the research and development of bio-based polymers. (1,2)

PAEK (Polyaryletherketone) is a high-performance thermoplastic polymer that is known for its high strength, stiffness, heat resistance, chemical resistance, and dimensional stability. It is often used in various industrial sectors such as automotive, aviation, spacecraft, electronic/electrical industries, and medical devices.(3)

However, their production relies heavily on fossil fuel-derived raw materials. This has led to an increasing interest in developing bio-based alternatives for PAEK, aiming to reduce the environmental impact and enhance sustainability. Full and partial bio-based PAEK materials are derived from renewable resources such as biomass, lignin, or plant oils, providing a more sustainable and eco-friendly option for various applications.(4)

Vanillin methyl ether, found in straight lemongrass, is an important fine chemical intermediate and is widely used in the synthesis of food spices and fragrance formulations. In this research, Vanillin methyl ether based PAEK was prepared. The effect of benzaldehyde based PAEK on the polymeric properties were also studied to compare the performance according to the results from NMR, FTIR, XRD, SEM, TGA, DSC, SEC, and contact angle.

Recently we tried to produce a plastic sheet in the extrusion, the material started to melt at 80 degrees and afforded a brittle sheet at room temperature.

Therefore, this research provided a solid theoretical and experimental basis for the preparation of bio-based new performance super engineering plastics.

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