

Dr Pratheep Kumar Annamalai

AQ-Senior Research Fellow
Australian Institute for Bioengineering and
Nanotechnology (AIBN)
The University of Queensland, Australia

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Unlocking the Potential of Kraft Lignin for Polyurethane Applications

The value-added utilisation of lignin, a by-product vastly generated from pulp and biofuel biorefinery industries has gained attention in both academia and industries, due to growing awareness on biobased economy and sustainability. Owing to its aliphatic and aromatic functional groups, physical properties and natural abundance, lignin offers great potential as a sustainable raw material for polyurethane plastics. This presentation will explore the recent understanding and pathways to unlock the potential of the highly produced technical lignin 'Kraft lignin (KL)' for polyurethanes without chemical modification or usage of solvents. Specifically, it will discuss the approaches for utilising lignin in polyurethane insulation foam without compromising on mechanical properties.

Dr. Pratheep Annamalai is a polymer and nanomaterials scientist with a keen interest in engineering materials for sustainable living. He has extensive expertise in both translational and fundamental research using nanotechnological tools towards sustainability. Before joining UQ, Pratheep studied Chemistry in University of Madras, received PhD in Chemistry from University of Pune (India), then went on to work on hydrophobic membranes at the Université Montpellier II (France), and on 'stimuli-responsive smart materials' at the Adolphe Merkle Institute - Université de Fribourg (Switzerland). Upon being instrumental in the discovery of 'spinifex nanofibre nanotechnology' and establishing Australia's first nanocellulose pilot-plant, he has been awarded UQ Excellence awards for leadership and industry partnerships for 2019. He has been guest/academic editor for various journals and member on UQ's ethics and early career researchers' committees.

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