

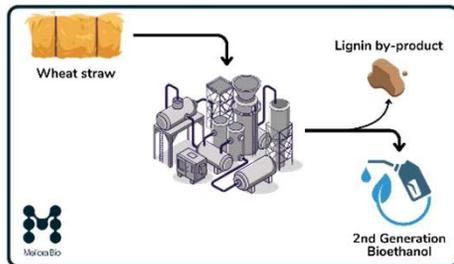


Lignin by-product valorization as a bitumen modifier

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Introduction



Petroleum-based **bitumen** used in road construction.

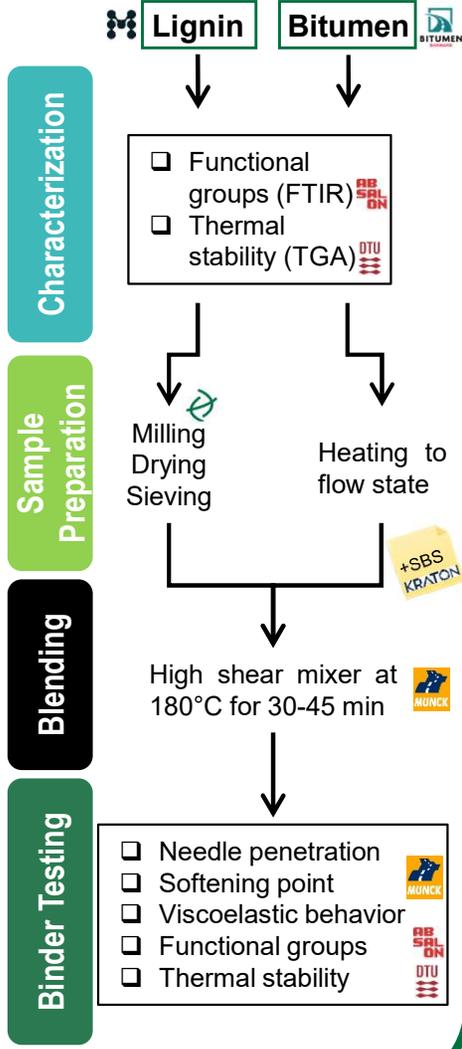
Plant polymer with chemical similarities to bitumen.

Properties depend on:

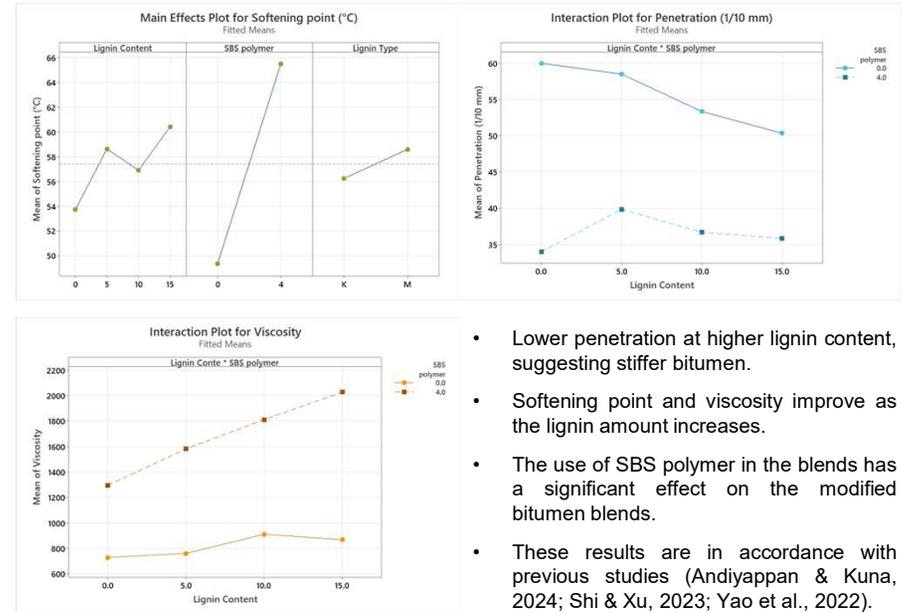
- Source
- Degree of substitution
- Blending conditions
- Compatibility

Project objective: to assess whether the lignin produced by Meliora Bio is suitable as an additive in bitumen to enhance the performance and sustainability of asphalt applications.

Methods



Outcome



- Lower penetration at higher lignin content, suggesting stiffer bitumen.
- Softening point and viscosity improve as the lignin amount increases.
- The use of SBS polymer in the blends has a significant effect on the modified bitumen blends.
- These results are in accordance with previous studies (Andiyappan & Kuna, 2024; Shi & Xu, 2023; Yao et al., 2022).

Perspectives

Lignin from 2nd-generation bioethanol production alters the chemical and physical properties of bitumen, **increasing stiffness** for potential **high-temperature pavement** applications. Further testing is needed, particularly on aging resistance and stability.

Being a Helix Lab Fellow:

- Collaboration
- Networking
- Solving real-world problems
- Social and professional experiences
- Learning from other cultures and backgrounds