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Defence announcement **Public Defence on 15.03.2024**

Synthesis and structure-property correlations of polyurethanes for additive manufactured biomedical materials

Title of the doctoral thesis	Synthesis and structure-property correlations of polyurethanes for additive manufactured biomedical materials
Content of the doctoral thesis	In recent years, 3D printing has gained significant traction in tissue engineering for scaffold creation, owing to its precision, manufacturing convenience, and rapid production capabilities. Stereolithography (SLA) and direct ink writing (DIW) stand out as the predominant techniques in this domain. Nonetheless, the availability of biodegradable and biocompatible polymers, notably within the polyurethane (PU) group, for 3D printing remains limited. This study aimed to develop biodegradable, biocompatible, and printable PUs, encompassing isocyanate-based and non-isocyanate-based polyurethanes, and their composites, specifically tailored for nerve and skin regeneration. Photo-cross-linkable PU resins and a conductive composite derived from the resin were successfully synthesized and printed with precise geometries. Moreover, a novel series of non-isocyanate-based polyurethanes (NIPUs) utilizing various diamines was synthesized successfully, with an investigation into the correlation between polymer structure and resulting properties. Subsequently, a biocompatible, antibacterial hydrogel composite was synthesized using a particular variant of NIPUs.
Field of the doctoral thesis	Polymer Technology
Doctoral candidate and contact information	M.Sc. (Tech.) Afsoon Farzan afsoon.farzan@aalto.fi and afsoonfarzan@gmail.com
Public defence date and time	15 March 2024 at 12 o'clock (in Finnish time)
Remote defence	https://aalto.zoom.us/j/66904650276
Place of public defence	Aalto University School of Chemical Engineering, Lecture hall Ke2 (Komppa-Sali), Kemistintie 1, (main door at Biologinkuja) Espoo
Opponent(s)	Professor Heikki Juhani Tenhu, University of Helsinki, Finland
Custos	Professor Jukka Seppälä, Aalto University School of Chemical Engineering
Link to electronic thesis	https://aaltodoc.aalto.fi/handle/123456789/51
Keywords	Polyurethane, Non-isocyanate polyurethane, Stereolithography, Tissue regeneration, Photo-crosslinking, Direct ink writing, Conductivity

Dissertation will be on public display at https://aaltodoc.aalto.fi/doc_public/eonly/riiputus/