



<b>General information</b>	
PPP-number	TKI-AF 17029
Title	Production and evaluation of furanic intermediates and aromatic derivatives from biomass (FIAD 2.0)
Theme	Chemistry
Implementing institute	Wageningen Food and Biobased Research (Wageningen) and TNO (Delft)
Project leader research (name + e-mail address)	Shanmugam Thiyagarajan (shanmugam.thiyagarajan@wur.nl)
Coordinator (on behalf of private partners)	
Project-website address	<a href="https://topsectoragrifood.nl/project/af-17029-production-and-evaluation-of-furanic-intermediates-and-aromatic-derivatives-from-biomass/">https://topsectoragrifood.nl/project/af-17029-production-and-evaluation-of-furanic-intermediates-and-aromatic-derivatives-from-biomass/</a>
Start date	01-Oct-2018
Final date	1 <sup>st</sup> May 2020*

**\* Actual end date was 1st February 2020, however not all of our project activities are finished yet. So we would like to extend it to 1<sup>st</sup> of May 2020 (consortium partners are engaged in testing the samples that were delivered with a bit of delay than expected).**

<b>Approval by the coordinator of the consortium</b>	
The final report must be discussed with the coordinator of the consortium. The "TKI's" appreciate additional comments concerning the final report.	
Assessment of the report by the coordinator on behalf of the consortium:	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Not approved
Additional comments concerning the final report:	The committed HMA samples are delivered to the industrial partners and now waiting for their evaluation in the performance of HMA sample in their application testing. The final progress meeting is planned to be scheduled in April 2020. Based on the inputs from industrial partners the final report will be prepared.

<b>Consortium</b>	
Mention any changes in the composition of the project partners:	No changes

<b>Summary of the project</b>	
Problem definition	The FIAD2 is a continuation of the previous FIAD project (ended in 2017). The FIAD resulted in the development of versatile generic technology for the production of (near)drop-in aromatic molecules for example hemimellitic acid (HMA) in particular. This prompted to continue further as FIAD 2.0 for the production of HMA in the larger sample size for further evaluation in the application testing.

Project goals	<p>The main goals of FIAD2 is to develop scalable, Hydrazone-based, Diels-Alder technology for the production of hemi-mellitic acid (HMA). Specific objectives of the project includes:</p> <ul style="list-style-type: none"> <li>- to apply continuous production technologies for each of the different chemical reactions required to convert furfural, a bulk chemical which is currently produced from agricultural side streams, into HMA;</li> <li>- to assess the impact of the quality of furfural on the purity of the end-product HMA;</li> <li>- to supply samples size of 0.5 kg in the first phase and 5 kg in the second phase to each industrial consortium partners (Covestro and Klueber);</li> <li>- to further evaluate the potential applicability of biobased HMA in polyurethane applications and in lubricant products for the automotive sector;</li> <li>- to provide feedback on required purity and undesired impurities and impurity profiles relating to the produced bio-based HMA;</li> <li>- to adapt production protocols accordingly and provide additional HMA samples for application testing by Covestro and Klueber;</li> <li>- to use the project results as a basis for making decisions on subsequent upscaling of the specific technology to demo scale (~50 tons/annum).</li> </ul>
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<b>Results</b>	
Planned results in the original project plan	Biobased HMA sample (0.5 kg in first phase and 5.0 kg in second phase) delivery to industrial partners.
Achieved results	The scalable Hydrazone-based, Diels-Alder technology is developed for the production of hemi-mellitic acid (HMA). The two-sample sizes (0.5 kg in first phase and 5.0 kg in second phase) has been successfully synthesised in the desired purity level and delivered to each partners for further application testing.
Explanation of changes relative to the project plan	No changes in the project plan.

<b>What was the added value created by the project for:</b>	
Participating "Knowledge Institutes" (scientific, new technologies, collaboration)	Development of scalable technology for the production of biobased aromatics, HMA in particular is achieved in this project.
Participating private partners (practical application of the results, within which period of time?)	Both Covestro and Klueber are investigating the possibilities of filing an individual patent application based on the performance of HMA in their application testing.
Society (social, environment, economy)	---

Possibly other stakeholders (spin-offs)	---

<b>Follow-up</b>	
Did the PPP result in one or more patents (first filings)?	Both Covestro and Klueber are investigating the possibilities of filing an individual patent application based on the performance of HMA in their application testing.
Are there any follow-up projects planned? If yes, explain. (Contract research resulting from this project, additional funding, or new PPP projects)	Not yet, however during the final progress meeting the possibility of follow-up/ new project or further directions will be discussed.

<b>Deliverables/products during the entire course of the PPP</b> (provide the titles and/or a brief description of the products/deliverables or a link to a website.)
<u>Scientific articles:</u>  None yet.
<u>External reports:</u>  ---
<u>Articles in professional journals/magazines:</u>  ---
<u>(Poster) presentations at workshops, seminars or symposia.</u>  ---
<u>TV/ radio / social media / newspaper:</u>  ---
<u>Remaining deliverables (techniques, devices, methods, etc.):</u>  ---

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<https://www.wur.nl/nl/Onderzoek-Resultaten/Onderzoeksprojecten-LNV/Expertisegebieden/kennisonline/AF-17029-Production-and-evaluation-of-furanic-intermediates-and-aromatic-derivatives-from-biomass.htm>