

High-performing, safe and sustainable chemicals from waste wood

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The chemical building block called levoglucosenone, which was discovered in 70's, has until recently only been available in limited quantities. Following a rigorous development program we have developed a continuous thermochemical process to convert wood waste into levoglucosenone such that much larger volumes are available. In this presentation, the opportunities for this material and its derivatives will be explored with the source sustainability and process ecofriendliness highlighted.

Levoglucosenone contains six differentially functionalised carbon atoms, two cyclic ether groups, two chiral centres, and a C=C double bond conjugated with a ketone - making it a very attractive substrate from which to construct existing and new chemicals.

One of such chemicals is novel solvent Cyrene or dihydrolevoglucosenone, which is derived in one step from levoglucosenone through hydrogenation and has been shown to be a high-performing and safe alternative to reprotoxic solvents such as NMP and DMF for the production of high-performance materials, pharmaceuticals and graphene formulations.

Another example of levoglucosenone derivative is chiral intermediate (S)- γ -Hydroxymethyl- α,β -butenolide, which can be derived from levoglucosenone by Baeyer-Villiger oxidation and further converted into a range of higher value products including flavours, insect pheromones and specialty polymers.