Nitroxyl-Mediated Oxidation Of Lignin And Polycarboxylated Products

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The Invention

Methods of selectively modifying lignin, polycarboxylated products thereof, and methods of deriving aromatic compounds therefrom. The methods comprise electrochemically oxidizing lignin using stable nitroxyl radicals to selectively oxidize primary hydroxyls on β-O-4 phenylpropanoid units to corresponding carboxylic acids while leaving the secondary hydroxyls unchanged. The oxidation results in polycarboxylated lignin in the form of a polymeric β-hydroxy acid. The polymeric β-hydroxy acid has a high loading of carboxylic acid and can be isolated in acid form, deprotonated, and/or converted to a salt. The β-hydroxy acid, anion, or salt can also be subjected to acidolysis to generate various aromatic monomers or oligomers. The initial oxidation of lignin to the polycarboxylated form renders the lignin more susceptible to acidolysis and thereby enhances the yield of aromatic monomers and oligomers obtained through acidolysis.

Additional Information

For More Information About the Inventors

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Tech Fields

- Clean Technology : Biobased & renewable chemicals & fuels

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854