

# Synthesis of Xylitol from Biorenewables using Chemo-catalytic Routes: Review <sup>†</sup>

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**Abstract:** Xylitol is one of the twelve platform chemicals, with many health benefits, being a building block for the production of many high-value chemicals along with no petrochemical alternative. Xylitol is produced from Xylose, one of the monomers of hemicellulose. These initial compounds are derived from waste biomass or non-food biomass. Synthesis methods are widely divided into Chemical processes which are adopted by most industries and biological routes. Biological routes are slow and need to be investigated on a large scale, while chemical routes need to be modified for more economically viable processes. At large, all the chemical processes follow the steps as hydrolysis of lignocellulosic (with hemicellulose) biomass to Xylose, followed by purification and hydrogenation of Xylose to Xylitol, and final purification of the final product. Typically industrial processes utilize different types of homogenous and/or heterogeneous catalysts. Most commonly, metal-doped supports and metals alone are used as catalysts such as Renny Nickel, Pt/C, Ru/C. At the same time, some research is also carried out on Heteropoly acids, biomass-derived catalysts such as Lactic acid, and other such catalysts. Different parameters are also investigated for their effect on the percentage yield of xylitol, which are a type of biomass, temperature, pressure, type of catalyst, amount of catalyst, reaction time, rate of agitation, pH. Kinetics are needed to be investigated for optimizing the processes parameters to get a higher yield. As of now, the process used in industries hardly obtains the 50-60 % yield of xylitol based on hemicellulose. Here different catalysts for xylitol synthesis from biomass are reviewed.

**Keywords:** xylitol; catalytic processes; biorenewables.

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## Conflicts of Interest

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