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**Acid catalyzed condensation of levulinic acid with glyoxylic acid:  
Synthesis of 1-methyl-2,8-dioxabicyclo[3.3.0]oct-4-ene-3,7-dione**

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*Abstract:* The sulfuric acid catalyzed condensation of levulinic acid with glyoxylic acid at 80 °C, for 24 h under neat conditions gives 1-methyl-2,8-dioxabicyclo[3.3.0]oct-4-ene-3,7-dione in 92% yield. Catalytic reduction of this unsaturated *bis*-lactone provides a facile route to produce polyester monomer 1-methyl-2,8-dioxabicyclo[3.3.0]octane-3,7-dione from renewable feedstocks.

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*Keywords:* levulinic acid; glyoxylic acid; aldol condensation; polyester monomer; *bis*-lactone

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The increasing concern over declining petroleum reserves and climate change has promoted current explorations for renewable resources based fuels as well as platform chemicals for chemical and polymer industries. Triglycerides, succinic acid, lactic acid, glycerol, 5-hydroxymethylfurfural, furfural, and 4-oxopentanoic acid or levulinic acid (LA, 1, figure 1) produced from plant based biomass are the forefront of this new generation of feedstocks<sup>1, 2, 3</sup>. Levulinic acid is a key renewable feedstock chemical since this five carbon keto-acid can be produced from the most abundant biopolymer cellulose *via* a series of acid catalyzed reactions in water<sup>4</sup>. It was listed as one of the top 12 most promising value added chemicals from biomass by the Biomass Program of the US

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