

# Dimer Acid-Based Polyurethanes: A Second Generation Raw Material for Coating Industry †

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**Abstract:** The focus of polymer industries is shifting towards polyurethanes because of their versatile applications in the production of thermoplastics, foams, adhesives, coatings, textiles, elastomers, and packaging materials. However, the conventional raw material for synthesizing polyurethane includes di-isocyanates that are carcinogenic and potentially hazardous for the ecosystem. Considering this environmental threat, the non-isocyanate polyurethanes have become an innovative area of research. The main raw material for non-isocyanate polyurethanes is dimeric fatty acids which are derived from vegetable oils. The formation of a fatty acid dimer follows the Diels Alder mechanism, which involves the free radical addition of two conjugated polyunsaturated fatty acid molecules. This paper focuses on various methods of synthesis of dimeric fatty acids and their reaction mechanism, and their applications in polyurethane manufacturing.

**Keywords:** dimer; polyurethane; isocyanate; thermoplastic; adhesive; coating; adhesive; elastomer.

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## Conflicts of Interest

The authors declare no conflict of interest.