
Polyurethane dispersions from biotechnologically modified vegetable oils



One focus of research at WKI is the synthesis of waterborne polyurethane dispersions utilizing biobased raw materials, which have their origin in vegetable oils and sugars. One example is the building block 1,3-propanediol which was realized in a cooperation project together with German and Indonesian research institutes and industrial partners, by means of biotechnological conversion of glycerol. The use of 1,3-propanediol causes an improvement of the flexibility-elasticity-ratio comparing to usual building blocks and thus enabling a substitution of conventional diols, such as e.g. 1,6-hexanediol, which might cause a cost reduction. Therefore, these polyurethane dispersions can be used as plasticizing component for weather-resistant PU acrylate dispersions. The portion of the biotechnological based components of the polyurethane dispersions actually amounts up to 34 %. Another application of 1,3-propanediol based polyurethane dispersions is the reduction of solvents in waterborne acrylics by lowering the minimum film-forming temperature. With other resins it was possible to generate furniture coatings which fulfill the normative requirements of DIN 68861. From an economic point of view these products are mostly comparable to products based on petrochemicals.



Further investigations are planned, utilizing new building blocks in the scope of biotechnology and the additionally use of renewable raw materials within the synthesis enabling the production of polyurethane dispersions with a biogenic portion exceeding far more than 70 %.

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