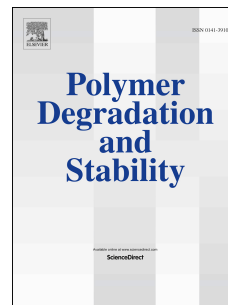


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Hydrolysis of waste monomer casting nylon catalyzed by solid acids

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# 1 **Hydrolysis of waste monomer casting nylon catalyzed** 2 **by solid acids**

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## 9 **Abstract**

10 Decomposing the waste polyamide material onto economically-valuable monomer  
11 under the relatively mild hydrothermal conditions is a key technology for the  
12 development of wastes recycling. This reaction is traditionally catalyzed by  
13 homogeneous acids which would result in the difficult separation and equipment  
14 corrosion. We first indicated the solid catalysts for the hydrolysis of waste monomer  
15 casting nylon in subcritical water, including a series of  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> supported solid acid  
16 catalysts and some commercial zeolites. Zeolite H $\beta$ -25 exhibited the highest activity  
17 among the H-form zeolites, and a better recyclability than the  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> supported solid  
18 acids. According to the kinetic analyses and reaction pathway exploration, the  
19 generation and consumption of linear oligomers, which are the intermediate products,  
20 were accelerated when using the zeolite H $\beta$ -25 because of the microporous structure.

21 **Keywords:** Catalyzed hydrolysis; Solid acids; Waste nylon; Reaction kinetics

22

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