PRODUCTION OF CAPROLACTAM FROM ADIPIC ACID

ABSTRACT

Processes are disclosed for the conversion of adipic acid to caprolactam employing a chemocatalytic reaction in which an adipic acid substrate is reacted with ammonia and hydrogen, in the presence of particular heterogeneous catalysts and employing unique solvents. The present invention also enables the conversion of other adipic acid substrates, such as mono-esters of adipic acid, di-esters of adipic acid, mono-amides of adipic acid, di-amides of adipic acid, and salts thereof to caprolactam. Solvents useful in the process that do not react with ammonia are also disclosed. Catalyst supports are disclosed which catalyze the reaction of the substrate with ammonia in the absence of added metal. Metals on the catalyst supports comprise ruthenium (Ru), rhodium (Rh), palladium (Pd), osmium (Os), iridium (Ir), and/or platinum (Pt). Heterogeneous catalysts comprising ruthenium (Ru) and rhenium (Re) on titania and/or zirconia supports are also disclosed. Further, disclosed are products produced by such processes, as well as products producible from such products.