Magnesium Oxide-Catalyzed Conversion of Chitin to Lactic Acid

Invited for this month’s cover are the groups of Prasert Reubroycharoen at the Chulalongkorn University (Thailand) and Aritomo Yamaguchi at the National Institute of Advanced Industrial Science and Technology (Japan). The cover picture shows the conversion of chitin, which is generated by food processing, into lactic acid with catalysis by magnesium oxides. Although chitin, a main component of the shells of crustaceans, can be converted to valuable products by means of homogeneous catalysis, most of the chitin is treated as industrial waste because use of homogeneous catalysts is compromised by difficulties associated with product separation from the catalysts and the recyclability of the catalysts. Thus, a method for converting chitin to useful chemicals, such as lactic acid, by using solid catalysts would be beneficial. Magnesium oxide catalysts can be reused twice without loss of activity. Read the full text of their Full Paper at 10.1002/open.202000303.

What was the biggest challenge (on the way to the results presented in this paper)?
The biggest challenge was finding the solid catalysts to convert chitin to useful chemicals.

What aspects of this project do you find most exciting?
The most exciting aspects is the conversion of food waste to valuable chemicals. Chitin, which is generated by food processing, can be converted into lactic acid with catalysis. Lactic acid is widely used in the food, cosmetic, pharmaceutical, and chemical industries, particularly for polylactic acid production.

What new scientific questions/problems does this work raise?
The new problem is the difficulty to obtain nitrogen-containing chemicals from chitin. Next, we will challenge chitin conversion into nitrogen-containing chemicals using solid catalysts in water at a milder condition.