Processes for the oxidation of alcohols and for the cleavage and oxidation of waxes

Reference No: B77145 | B77146

CHALLENGE
Oxidation of long-chain alcohols (C12-C36) as well as cleavage and bleaching of waxes (e.g. for food and pharmaceutical industries) are currently mainly done with chromosulfuric acid. The latter is highly toxic and harmful to the environment, and specialty chemicals that can be used as an alternative are very expensive. Also, important raw waxes like rice bran wax, which could replace fossile montan wax or expensive carnauba wax, are difficult to refine with chromosulfuric acid.

INNOVATION
The new technology successfully uses a water soluble catalyst in combination with an oxidant that yields non-toxic side products. Raw materials are processed either melted or in solution. Important advantages of the new process are:

- Costs for chemicals reduced by over 70%
- Very short reaction times
- Better use of reaction volume (25% of used volume are product)
- Environment-friendly
- High conversion rates and selectivity
- Simple final processing/recovery of the products with water
- Existing production facilities can be used

COMMERCIAL OPPORTUNITIES
Waxes play an important role in many products in our daily lives. Amongst others, the invention is thus relevant for the following fields:

- Food industry
- Pharmaceutical industry
- Cosmetics industry
- Plastics processing
- Polishes and plant protectants
- Paints and inks

DEVELOPMENT STATUS
Proof of concept.
Ready to use.

Figure: A) Schematic representation of the oxidation process. B) Laboratory scale implementation. Refined wax forms a separate phase over aqueous reaction solution. C) Hardened refined wax. (photographs © T. Hofmann).