Azelaic Acid
the active material

Azelaic acid (1,7-hepanedicarboxylic acid) is a naturally occurring dicarboxylic acid. It occurs amongst others in cereals like wheat, barley and rye. Extracts of these cereals have been used since 3000 years in Ayurveda products to treat hyperpigmentation (skin lightening). Azelaic acid also exhibits bactericidal properties, and was shown to be very effective for the treatment of acne vulgaris. Azelaic acid has also been shown to be effective for the treatment of baldness.

Azelaic acid obtained from natural resources is not commercially available; the extraction process is very difficult and expensive. On the other hand, azelaic acid can also be produced by ozonisation of oleic acid. Ozonisation is a hazardous reaction that can easily run out of control. The alternative is oxidation of oleic acid with peracetic or performic acid. This route goes via the 9,10-epoxide, followed by subsequent oxidation of the epoxide. The oxidation of oleic acid results in the formation of azelaic acid and nonanoic acid. Oleic acid required is obtained from hybrid sunflower oil and milk thistle oil. This choice of starting material enables to produce a grade of azelaic acid of more than 99% purity where regular azelaic grades are specified at 85-90%.

Azelaic acid is an odourless, white and highly crystalline solid with a melting point of 110ºC. It is soluble in glycerol and glycols, but poorly soluble in water (2,1 g/l). The solubility of azelaic acid is pH dependant; the mono- and disodium salts are significantly better. Also micro-emulsions based on sorbitan esters using glycerol and lauryl alcohol as co-surfactants enable to dissolve azelaic acid.