

From natural dyes from plant sources to inkjet ink

Development of dyes and pigments from mushrooms and dye plants to manufacture inkjet inks for industrial product marking

in cooperation with the Institute of Organic Chemistry and Macromolecular Chemistry of the Friedrich-Schiller-University in Jena

With support from

 by decision of the
 German Bundestag


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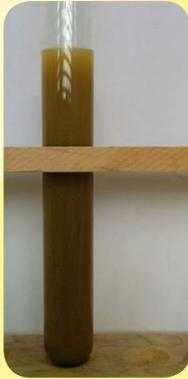
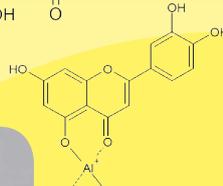
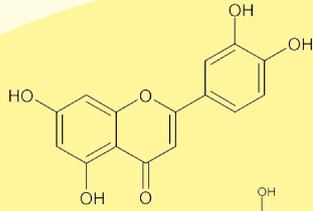

 The brand of green ink

Dyer's rocket *Reseda luteola* is a plant yielding yellow dye which contains the dye luteolin, a member of the flavanoid family.

Madder *Rubia tinctorum* was the dyeing substance for red fabrics in the middle ages. As well as the alizarin dye madder also contains anthraquinone dyes.



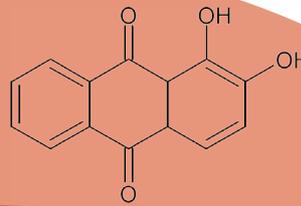
The yellow dye can be gained by water based extraction from the flowering plants.



To make the extraction suitable for inkjet a complex with cations is formed



which significantly enhances the colour and improves durability.

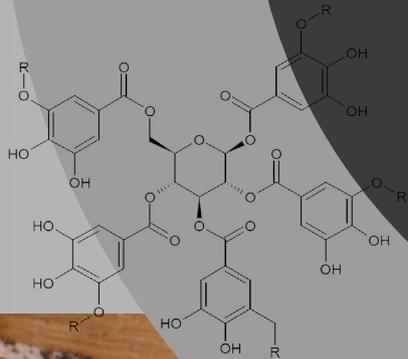


Through the complexing process a red ethanol soluble dye is produced from the alizarin of the madder which can be used in printing systems.



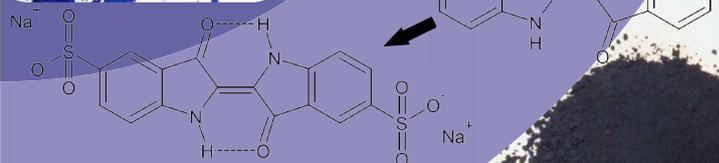
Furthermore it is possible to change the dye into a non-soluble pigment.

Tannin is a polymer compound which consists of several units of ellagic and gallic and further acids. This diversity creates many shades of black and grey from different tannins.



Tannins can be gained from plants such as chestnuts, oak trees or walnuts. Different sorts produce different types of tannins.

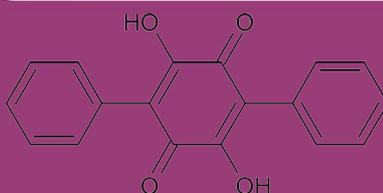
Indigo is available in different modifications. Of note is the water soluble food dye E132 and its laking complex which forms an insoluble pigment.



Indigo can be gained from the leaves of the dyer's woad *Isatis tinctoria*. This naturally gained dye used to be used for dyeing textiles.



In addition we are developing further dyes and pigments, e.g. polyporic acid from the cinnamon bracket *Hapalopilus rutilans*.



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