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Industrial hemp – the big boom?!
Regulatory procedures – scale up – possibilities

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1 Introduction

Since 1985, hemp receives more and more attention, especially industrial hemp, which has a lower tetrahydrocannabinol (THC) content than the more famous hemp *cannabis sativa* colloquially called "marijuana". Next to THC, cannabidiol (CBD) is the most scientifically researched cannabinoid. It has been known for a long time that CBD has an anticonvulsant effect, reliefs symptoms from multiple sclerosis, is effective against migraine and stimulates appetite.
Unfortunately, well-designed clinical studies are rare and medical reports are hardly available. Mostly personal experiences, reports individual cases or some animal experiments have been reported. This is one of the reasons, why CBD is currently applied as a kind functional food only.
Working with CBD and thus extracts from hemp also means working with the psychoactive part THC as well, although present only at a much lower concentration. Various patents cover the processing of hemp, registration for THC treatment is mandatory above a defined level and of course the economic scale up process are important points.

2 Industrial hemp

The difference between hemp and industrial hemp is that industrial hemp has lower THC levels and no personal psychoactive use.
For the EU and Switzerland an industrial hemp variety list exists and the permitted THC – content in the material differs for every country. Mostly the limit is set 0,2 wt% THC. Exceeding this limit (in the raw material or extracts) requires a narcotic license including well documented handling and safe storage.
One of the benefits of hemp is to use the whole plant, like fibers, seeds, nuts, leaves and flowers. To gain a high CBD – content in the extract, correct choice of starting material and extraction method is essential.

3 CO_2-Extraction

A method of use could be supercritical CO_2 extraction. Therefore liquid CO_2 is pressurized with a pump and heated up in a heat exchanger. Then the supercritical solvent flows through the extractor, which is charged with hemp-extract.
After the extraction the homogenous CO_2 / extract mixture is separated through pressure reduction into a CO_2 vapour and an extract phase. The extract can be removed from the process while the CO_2 gas is recycled again.

4 Conclusion

The CO_2 extraction enables to gain high-end hemp-extracts and hemp-oils, with a gentle treatment of the raw material and a great recovery rate of valuable oils and substances under an inert and oxygen free atmosphere. Different colours and contents of CBD can be created by this method. Even production scale at more than 500 ltr. is proven.