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CO₂ extraction - a versatile processing tool

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CO₂ can be used as a solvent for the extraction of mainly non polar substances. Beneficial for brewers is a CO₂ hop extract with all essentials from hop cones for the brewing process: α -acids for bitterness and microbiological protection as well as aroma oil for the different kinds of hop taste and hop flavour in beer. The yields of these components are remarkably high, e. g. some 95 % α -acids be found in hop cones are recovered in the extract if the extraction parameters are chosen properly. By a stepwise reduction of the separation pressure fractions of the extract with different composition can be achieved. One fraction contains less aroma oil but higher content of α -acids, the other contains less α -acids but higher oil concentration.

Hard resins and polyphenols remain in the extraction residue, not in the extract in case liquid or supercritical CO₂ at moderate pressures is used. But extracting with comparatively high pressures up to 1000 bars an extract is obtained even comprising polyphenols. A new method based on extracting the residues of ordinary extractions was developed with this expertise. As a result a green coloured extract containing 20-30 % of the iso-prenyl-flavonoid Xanthohumol (XN) was achieved. A boost of the XN concentration up to 85 % is possible by removing polar substances as e. g. Chlorophyll, applying pH variations.

Thus CO₂-extraction is a kind of process engineering that provides for different applications a variety of useful hop extracts which show remarkable long term stability.