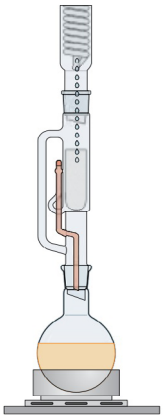
# Extraction Equipment

## extraction process

Extraction processes (more precisely: solid-liquid extraction process) are used to separate components from a solid sample. The objective of all extraction processes is to dissolve as much of the soluble components as possible with a specific amount of solvent. This is achieved by constantly vaporizing the solvent and allowing it to drip into the sample from a reflux condenser. The extracted component accumulates in the distillation flask.

Three types of extraction equipment are available from Koehler:

- Soxhlet Extraction
- Hot Extraction – Randall
- Hot Extraction – Twisselmann

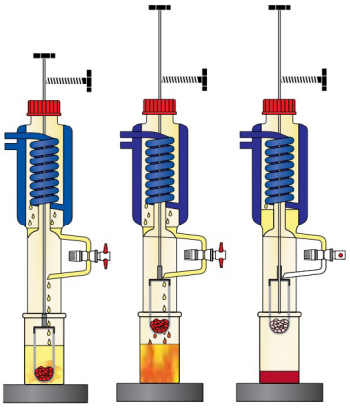


## soxhlet extraction

The standard extraction method is the Soxhlet method. Koehler offers a variety of options to fulfill all the various requirements in everyday laboratory practices:

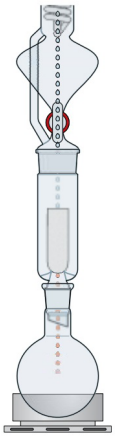
- Extractor sizes from 30 mL to 1000 mL
- Compact apparatus with one sample position
- Series extraction devices with 4 or 6 sample positions
- Extractors with specially developed siphon tubes guarantee consistent results across all sample positions
- Extractors with taps remove the need for additional distillation after the extraction
- Condensers with screw connections improve work safety
- Practical brackets for condensers and intermediate extraction pieces for safe storage between extractions

## randall hot extraction



The hot extraction process according to Randall consists of three steps: Boiling, Rinsing, and Evaporation (illustrated below). Benefits of the hot extraction process include:

- A compact apparatus with short process paths
- Low solvent requirements
- Short extraction period (typically about an hour)
- Due to the short extraction period, hot extraction is also gentle on the extract.



## twisselmann hot extraction

In the Twisselmann process, the vessel in which the extraction thimble is placed is open at the bottom; the extract immediately flows back into the distillation flask. The extraction thimble is constantly rinsed by the solvent from above and hot steam circulates below. The Twisselmann hot extraction functions in a similar manner to the Soxhlet extraction, however, the temperature in the sample in the extractor is extremely hot. This improves solubility and shortens the extraction time.

**Applications**

There are many everyday laboratory applications that require extraction methods. Below is a list of some common applications:

- Encased and bound fat in food
- Raw fat content in food and processed animal feed
- Composition of packaging material or consumer products
- Pesticide residues in grain products
- Crude fibre content

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