

# Filtration

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See also comparison of actual and checked version (<https://www.wikilectures.eu/index.php?title=Filtration&diff=-&oldid=13381>).

**Filtration** is employed to separate a dispersion according to the size of particles. The filtered mixture is applied on a **filter** made of a suitable porous substance. Particles smaller than the pores can cross the filter and get into the **filtrate** while larger particles are trapped on the surface of the filter.

## Filter

Filters are made of various materials. **Filtering papers** belong to the most traditional ones – these are special unsized papers of a suitable porosity. Gauze, cotton wool, glass wool and other materials can be used to filter out rough particles. On the other hand, speciality membranes made for example of cellulose acetate, PVDF, nylon or other materials are used for separation of smaller particles.

## Arrangement of Filtration

Filtering solution through filters with very small pores is time consuming. The process is faster if the pressure of filtered liquid is increased (**high-pressure filtration**) or the filtrate is aspirated (**vacuum filtration**).

The most simple example of high-pressure filtration is use of **syringe filters**. The filtered mixture is aspirated to a syringe. Encapsulated membrane filter is attached to it. Overpressure is reached with the piston of the syringe.

Syringe filters are used e.g. for sterilising solutions like eye drops in pharmacies.

A similar principle is employed in **centrifugation filters**. In this case, the filtration unit resembles a test-tube or micro test-tube. When the compartment for sample is filled with the filtered mixture, the whole unit is placed into a centrifuge. The centrifugation force speeds up the process of filtration.

**Vacuum filtration** is, on the other hand, based on aspirating the filtrate. In the classical arrangement, the filtration membrane is placed on the Büchner funnel that is attached to a vacuum flask. Disposable filtration units for vacuum filtration made of a suitable plastic are available today as well.



Filtering through a paper filter



Syringe filters (from <sup>[1]</sup>)



Centrifugation filter (from <sup>[2]</sup>)



Vacuum filtration (from <sup>[3]</sup>)

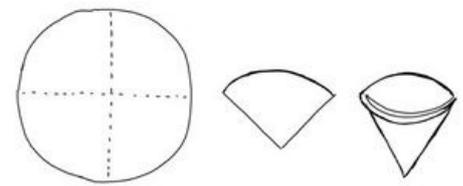
## Filtering through a Paper Filter

1. A circle of a filter paper is folded to quarters. Then it is unfolded so that it forms a cup.
2. The cup is placed into a funnel. Frequently, it should be moistened (usually with distilled water).
3. During filtration, the stem of the funnel should touch a wall of the collecting container. The filtered mixture is poured onto the triple layer of the filter paper.
4. The filtered mixture must be added slowly. It must never reach the top of the filtration paper or even overflow it.

# Links

## Related articles

- Introduction to Work in Chemical Laboratory
- Centrifugation
- Pipetting
- Pipettors



Folding a paper filter

## References

1. Labicom. *Filtrace* [online]. [cit. 2009-10-26]. <<http://www.labicom.cz/default.aspx?section=142>>.
2. National Scientific. *Centrifugal Filters* [online]. [cit. 2009-10-26]. <<http://www.nationalscientific.com>>.
3. Dartmouth College. *ChemLab. Vacuum Filtration* [online]. [cit. 2009-10-26]. <<http://www.dartmouth.edu/~chemlab/techniques/vfiltration.html>>.