

Methylcellulose (E461) Methylcellulose A

Culinary data

Methylcellulose A, used preferably at a rate of 1g for 100g of final preparation or less, is a thickener in the cold and a gelling agent at elevated temperatures.

It enables:

- to gel food preparations (foamy or not) only at elevated temperature,
- to reduce the penetration of oil while frying,
- to substitute the gluten.



Technological data

Dissolution

To dissolve methylcellulose A, it is recommended to disperse it in a small amount of hot water, then to allow hydration in the cold for a few hours. Care should be taken not to incorporate too much air, if it is not the desired effect, since the bubble once formed take long time to disappear. In the cold, the methylcellulose A stabilise the foams and thickens the food preparation, as a consequence of the increased viscosity. The amount usually used ranges from 0.5 to 1g for 100g of final preparation.

Gel setting

Gels are set at temperatures close to 60°C. The gels are firmer at concentration of 1 g for 100g of final preparation than at 0,5g for 100g of final preparation. These gels are thermoreversible: as the temperature is decreased below 30 to 40°C, the preparation is getting liquid again.

Sensory characteristics

Light wood taste

Influence du sel

Table salt decreases the temperature of gel setting.

Influence de l'alcool (éthanol)

Alcohol (ethanol) is increasing the temperature of gel setting.

Influence of the acidity

Methylcellulose A is little sensitive to the pH, and enables to work with pH ranging from 2 to 13.

Storage

Maximal temperature 25°C

Air moisture < 60%.

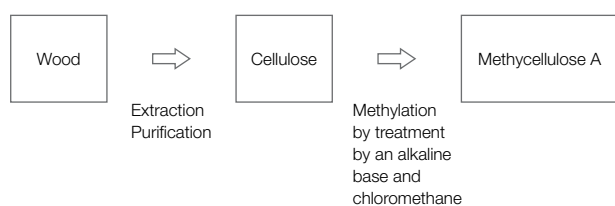
Toxicological data

- No acceptable daily intake level.
- The dose used should not exceed the required quantity in order to achieve the desired effect.
- Methylcellulose A, as cellulose, is not digested by humans that have not the necessary enzyme, and plays therefore the role of alimentary fibre.

Scientific data

Origin

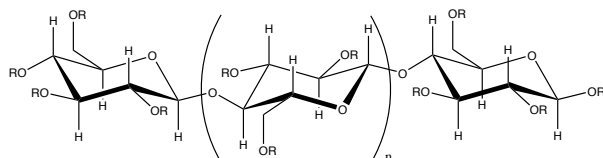
Cellulose is the most abundant polymer on Earth's surface. It is the main material used by plants to form their rigid structure. Cellulose is one of the constituent of wood, for example. Methylcellulose A is obtained by a chemical modification of cellulose.



Chemical composition

Methylcellulose A is obtained by treating cellulose with an alkaline base and chloromethane. Methylcellulose A is therefore a polymer (long molecules made by attaching one after the other a large number from one or several small molecules). Part of its hydroxyl groups is methylated. This modification makes the methylcellulose A soluble in water.

Structure of methylcellulose A



R = CH₃ in approx 2/3 of the case, H otherwise

The solubility of the methylcellulose A in water decreases as the temperature increases. This property explains the gel setting at elevated temperature.

Information from:

- Beltz H.-D., Grosch W., Schieberle P., *Food Chemistry*, 3rd Edition, Springer, **2004**, 331.
- Takahashi M., Shimazaki M., *J. Polym. Sci., Part B: Polym. Phys.* **2001**, 39, 943-946. *Formation of Junction Zones in Thermoreversible Methylcellulose Gels.*