

## Alginsphere (E401)

### Ingredients

Sodium alginate (E401) – Sunflower oil

### Culinary data

Alginsphere is a thickener with neutral taste.

In the presence of calcium ions, alginsphere is a gelling agent.

It enables:

- the thickening of a sauce usually obtained by addition of egg, fat or flour,
- the suspension of herbs or spices,
- the preparation of beads gelled on the outside and liquid inside. There are two techniques: “normale

spherification” (alginsphere into the liquid to be

“spherified”) or “reverse spherification” (alginsphere into the bath).

### Technological data

#### Dissolution

Alginsphere is soluble in water or juices, if:

- the content of calcium ions is low enough not to form a gel,
- the pH is higher than 4.

To obtain an efficient dissolution, the individual particles of alginsphere have to be well dispersed and should not keep in contact as they touch the water. This can be obtained by:

- sprinkling the alginsphere powder into a vigorously stirred solution.
- dry mixing the alginsphere into another solid ingredient of the recipe, like sugar, before addition to water.

For practical reasons, care should be taken to avoid incorporate too much air, because once the bubbles are formed it takes a long time to disappear, as a consequence of the increased viscosity.

Alginsphere is soluble in aqueous mediums containing up to 20% alcohol. It is used preferably at a dose comprised between 0.5 and 1g for 100g of final preparation.



#### Gel setting

Spherification and reverse spherification takes place when a calcium rich fluid and alginsphere containing fluid are set into contact. The calcium ions diffuse from the calcium rich fluid to these containing little or no calcium. The gel is forming thus initially at the “frontier” between the two fluids, creating a gelled film.

The thickness of this film depends on the contact time between the two liquids.

For the normal spherification, the calcium source is calcium salt. Practically, a content of 1g of calcium salt for 100mL of calcium bath is used.

For the reversed spherification, the calcium source is the food wanted to be spherified, like dairy products which naturally contain calcium or preparations in which calcium salt can be added.

#### Sensory properties

Gels are transparent and elastic. Alginsphere is neutral tasting.

#### Preservation

The spheres formed by spherification have to be served right after their making to conserve their liquid core.

On contrary, the pearls formed by reversed spherification can be prepared in advance, providing they are kept in an aqueous medium.

#### Freezing

The freezing has no impact on the gelling properties of Alginsphere. It's possible to make pearls from a frozen solution.

#### Storage

Store in a closed hermetic packaging, in a cool and dry place.

## Toxicological data

- No acceptable daily intake level.
- No known side effects in the concentrations used to obtain the desired effect.
- May cause flatulence at high doses.

## Scientific data

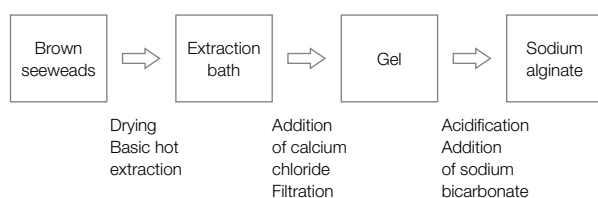
### Origin

The alginates are a family of polymers extracted from brown seaweeds (classe des *Phaeophyceae*). The brown seaweeds' genus frequently used or alginates' extraction are *Laminaria hyperborea*, *Macrocystis pyrifera*, *Ascophyllum nodosum*. Their preparation for an alimentary use include a control of the ions they contain. In the natural environment, alginates exist with a mixture of ions of types  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Ca}^{2+}$ .

### History

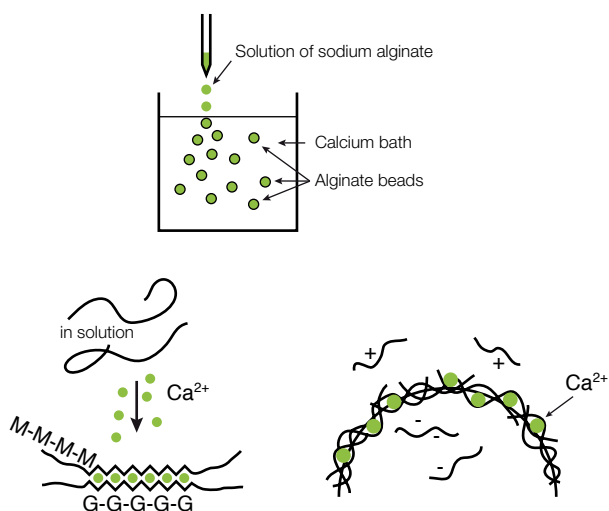
Sodium alginate has been discovered in 1881 by an English chemist named E.C.C. Stanford. Its commercial exploitation started only in the 1930s.

Informations from Sime W. J. in *Food Gels* (ed. P. Harris), Elsevier **1990**, 53-78



### Chemical composition

Sodium alginate is a polymer (long molecules made by attaching one after the other a large number from one or several small molecules) made of two carbohydrates: M and G on the scheme above (i.e. sugars in chemistry's words, with a meaning not restricted to table sugar). This polymer comes along with sodium ions. When calcium ions are added, the polymers wrap around them to form a gel.



*Mechanism of gel formation trough the interaction between calcium ions and sodium alginate.*