

Fact sheet

>>> Use of the Tanal range in food applications Application data-sheet

Ajinomoto OmniChem offers a wide range of tannins suitable for food applications. They can be used as:

- Stabilising agents for clarification and fining by protein binding of unwanted/undesired proteins
- Anti-oxidant and colour stabilising agents
- Taste modification agents
- Metal complexing agents to remove excessive amounts of metals (e.g. Fe)

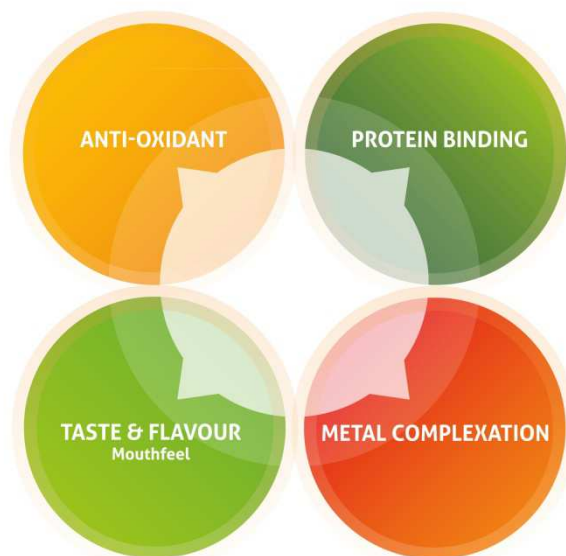


Figure 1.: Properties of tannic acid for food applications

>>> TASTE & MOUTHFEEL

>> Compensate flavour fluctuations

Tannic acid can be used to adjust or compensate flavour fluctuations in beverages. Depending on the crop, climatic conditions, etc. juices (e.g. grape, berry,...) can contain different tannin levels one year to another. Tanal 02 can help to stabilise the tannin content of these juices.

>> Impart dryness or astringency

Tannic acid can be used as flavouring ingredient to impart the typical mouth feel, dryness and astringency associated with tannins. Typical applications are use in ice-tea type beverages, grape or berry juices, energy drinks, solid flavoured drink powders,...

To this purpose, the hydrolysable grade Tanal 04 is best suited. Recommended dosage: 100 – 150 ppm

>> Taste masking agent

Tanal 02 can act as a taste masking agent. Tannic acid will bind on specific protein receptors on specific regions of the tongue, preventing the binding of some undesired flavour components:

- Reduce undesired taste components linked to artificial sweeteners
- Reduce the lingering (sweet) aftertaste of artificial sweeteners

By using artificial sweeteners combined with tannic acid, a taste profile more close to the taste profile of sugar can be obtained. We recommend the use of 100 ppm Tanal 02 for this purpose.

>>> METAL COMPLEXATION

Tannic acid is a strong metal chelator. Adding a suitable amount of tannic acid will help to prevent oxidative reactions linked to free metal ions.

Examples:

- Tanal 02 can help to reduce a mineral taste in some fruit juices
- Tanal 04 is used to remove excessive amounts of iron or other heavy metals in sugar refining
- In brewery applications, Brewtan® will help to prevent the Fenton oxidation reaction

>>> ANTI-OXIDANT

Tannic acids are amongst the most powerful natural anti-oxidants available.

The anti-oxidant capacity of different natural extract is compared in Figure 2. The anti-oxidant potential is evaluated with the TEAC (Trolox Equivalent Anti-oxidant Capacity) method.

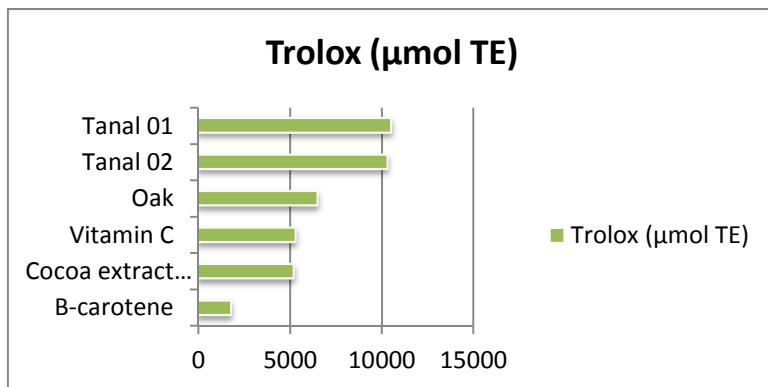


Figure 2.: Anti-oxidant capacity of natural extracts

>> Taste, colour & shelf-life

Tanal 01 and Tanal 02 are excellent radical scavengers and will help to improve the shelf-life, taste and colour of for example fruit juices. Recommended dosage for this application: 20 to 100 ppm.

In emulsions, Tanal 01 can help to improve the oxidative stability and reduce off-flavour formation and rancidity.

>> Colour stabilisation of anthocyanins

The stability of the natural colorant anthocyanin can be improved by adding tannic acid in the so called co-pigmentation process. Tannic acid and anthocyanins contain both hydrophobic parts; in a water based solution, they will interact in such a way that they will minimise the contact with the water molecules. By doing so, the anthocyanins will be less vulnerable to oxidative reactions. Figure 3. shows the non-covalent co-pigmentation complex.

Tanal 02 would be the best pick for colour stabilisation. We would recommend to add up to 100 ppm Tanal 02.

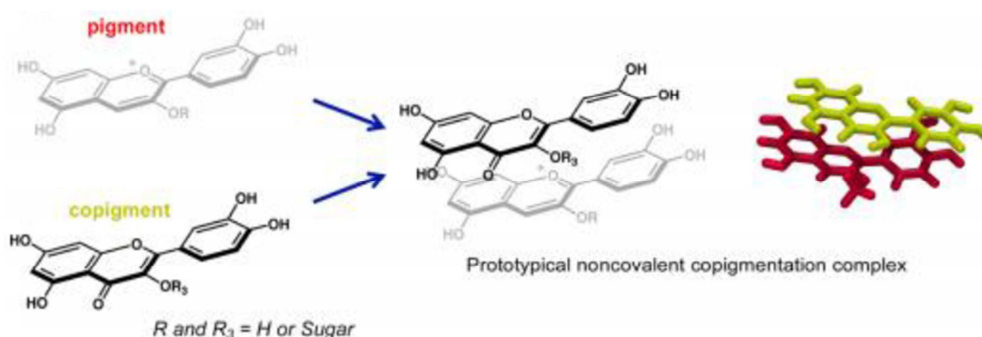


Figure 3.: Non-covalent co-pigmentation complex

>> Anti-oxidant fortified beverages

Tanal 01 and Tanal 02 can be added as anti-oxidant source in “healthy beverages”. A dosage of maximum 200 ppm is recommended.

>>> PROTEIN BINDING

Hydrolysable tannins are excellent protein binders through complex formation. They are able to remove undesired proteins and denature certain enzymes. Figure 3. shows the gallotannins – protein complex formation.

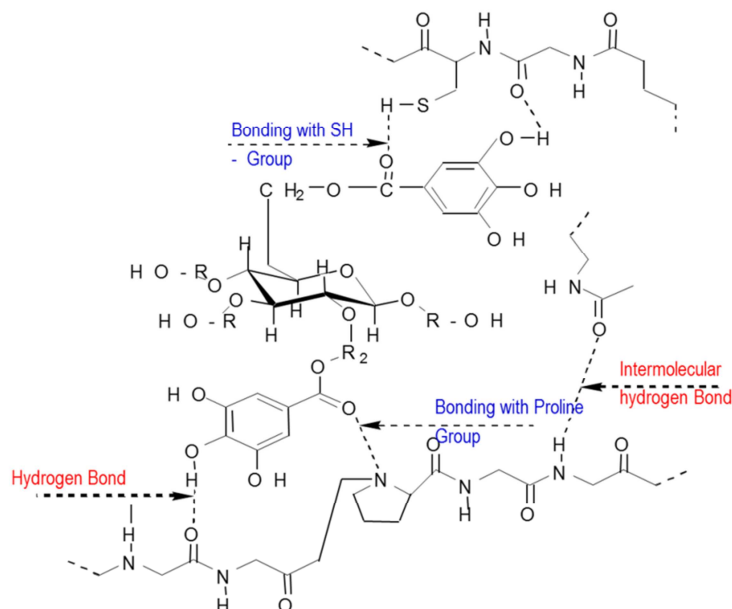


Figure 4.: Gallotannin – protein complex formation

In **soft drinks and juices**, Tanal 01 can be used as stabilising and clarification aid (removal of undesired proteins). This is usually accomplished by injecting a Tanal 01-solution followed by addition of gelatine. Typical dosage levels are 50 – 100 ppm Tanal 01 and 70 – 120 ppm gelatine (e.g. 100 Bloom).

A number of (synthetic) food colorants are notorious to produce stains on textile materials that are very difficult to remove using normal laundering. By adding a small amount of Tanal 01 to for example lemonades coloured with FD&C Red N°40, staining on textile goods can significantly be reduced. Addition levels in between 25 and 50 ppm are employed here.

The Brewtan® range has been developed specially for **brewing applications**. Brewtan® will remove selectively haze sensitive proteins (colloidal stability of beer). For more detailed information on the use of tannic acid in brewery applications, we refer to the specific fact sheets covering his topic.

In the **wine industry**, Tanal W1 is used as clarification aid by elimination of sensitive proteins. Further information can be found in the wine application fact sheet.

The information provided in this technical data sheet is based on the present state of our knowledge. Some of the applications mentioned in this document are protected by patent law. Ajinomoto OmniChem nv/sa cannot be held responsible for patent law infringements and the customer should contact the patent holder if so required. Due to the many process parameters involved we are not able to submit a general recommendation. It only shows without liability on our part the uses to which our products can be put. However, Ajinomoto OmniChem nv/sa cannot be held responsible for the consequences of the application of the above described product.