Jungbunzlauer

From nature to ingredients®

Functional Acids

Citric acid with added value

Taking effervescent formulations to the next level

Citric acid is a naturally occurring fruit acid and the most widely used organic acid for pharmaceutical, food and non-food applications. It has excellent properties as an acidulant or pH control agent. However, certain applications require more than the standard functionality offered by a regular grade of citric acid. Unique surface modification techniques and adding high-quality materials to the core product provide an exceptional range of functional acids.

The growing demand for sustainable products is shining a spotlight on environmentally friendly, water-free formulations in food, household and personal care. But the widespread use of citric acid in these dry formulations – in particular, effervescent formulations – poses major challenges for manufacturers during production and subsequent storage of the final products. In the field of pharmaceuticals and supplements, this also applies to powders and tablets where the stability of effervescent formulations needs to be improved or where directly compressible solutions are desired.

Modifying the particle surface of citric acid by using a coating or agglomeration process changes its physical properties and meets the demand for products with added value and improved properties. It should be emphasised that surface modification with hydrosoluble coatings does not affect the reactivity of citric acid and effervescent reaction starts without any delay.

Sustainability

Sustainability is a keystone of Jungbunzlauer's strategy and value proposition. Jungbunzlauer ingredients are manufactured through natural fermentation from renewable raw materials. With a long history of calculating carbon footprints and implementing sustainability initiatives, Jungbunzlauer has set ambitious emission reduction targets and committed to the SBTi (Science Based Targets initiative) in 2021. This includes measuring environmental parameters such as greenhouse gas emissions and water consumption, which are also disclosed in the annual sustainability report.

With our functionalised citric acids we support manufacturers in developing ecologically friendly formulations to meet consumer demand for innovative products in tablet and powder form. Compared to conventional liquid products, sustainable packaging solutions are possible and transport volume is significantly smaller, which reduces overall carbon footprints.

Citric Acid DC

Citric acid DC is a direct compressible citric acid with a thin layer of maltodextrin on the surface of the particles. Use of citric acid DC saves time and energy during pre-processing prior to the tableting process. Citric acid DC provides greater tablet hardness at a lower compression force compared to regular citric acid, and thus reduces the friability of pressed tablets during packaging and transport.

CITROCOAT® N

CITROCOAT® N is the Jungbunzlauer trade name for citric acid with a monosodium citrate coating. Compared to regular citric acid, CITROCOAT® N is less hygroscopic and less reactive with other crystalline ingredients. Various powder and tablet applications which are sensitive to humidity – in particular, effervescent formulations – can benefit from these outstanding properties.

CITROCOAT® EP

CITROCOAT® EP is an agglomerated effervescent compound, bringing citric acid and sodium bicarbonate together in the right composition to create a highly reactive but storage-stable effervescent powder. In order to prevent premature reactions, the citric acid used is coated with a thin layer of monosodium citrate. An additional agglomeration step of the two effervescent components using a binder, reduces the potential for segregation and improves compressibility. This leads to significantly harder tablets than with a formula based on a regular citric acid and sodium bicarbonate.

Legal aspects and certifications

Citric acid DC, CITROCOAT® N and CITROCOAT® EP may be used in food and personal care applications, they are Kosher and Halal certified.

Jungbunzlauers functionalised citric acids have been classified as ingredients of 100 % natural origin and are approved for the use in personal care products certified according to the COSMOS standard, as well as in detergent formulations certified according to the ECOCERT standard for natural detergents and natural detergents made with organic.

Approved by ECOCERT RAW MATERIAL

COSMOS APPROVED

Approved by ECOCERT RAW MATERIAL

DETERGENTS

Tackling challenging formulations

Each product in the functional acids range addresses different challenges with a view to improving processability during production and the properties of the final product.

Humidity

Challenging humidity conditions during production and storage of the final product require materials with improved stability properties to avoid premature reactions of various solid formulations. For powder and tablet applications, where the hygroscopic nature of regular citric acid causes problems and premature reactions can occur, CITROCOAT® N and Jungbunzlauer's finished solution CITROCOAT® EP are the products of choice, especially for effervescent formulations. CITROCOAT® N improves powder and tablet applications where regular citric acid would cause higher moisture uptake and thereby lead to enhanced storage stability. CITROCOAT® EP offers in addition the advantage of a homogenous mixture of coated citric acid and sodium bicarbonate, resulting in excellent reactivity of both components.

A wide range of applications, from detergent powder to confectionery, health care products such as direct sticks or effervescent tablets, and various dry household and personal care applications can benefit from the stabilising properties of these products. As a result, the use of functional acids enables the introduction of sustainable, eco-friendly packaging solutions.

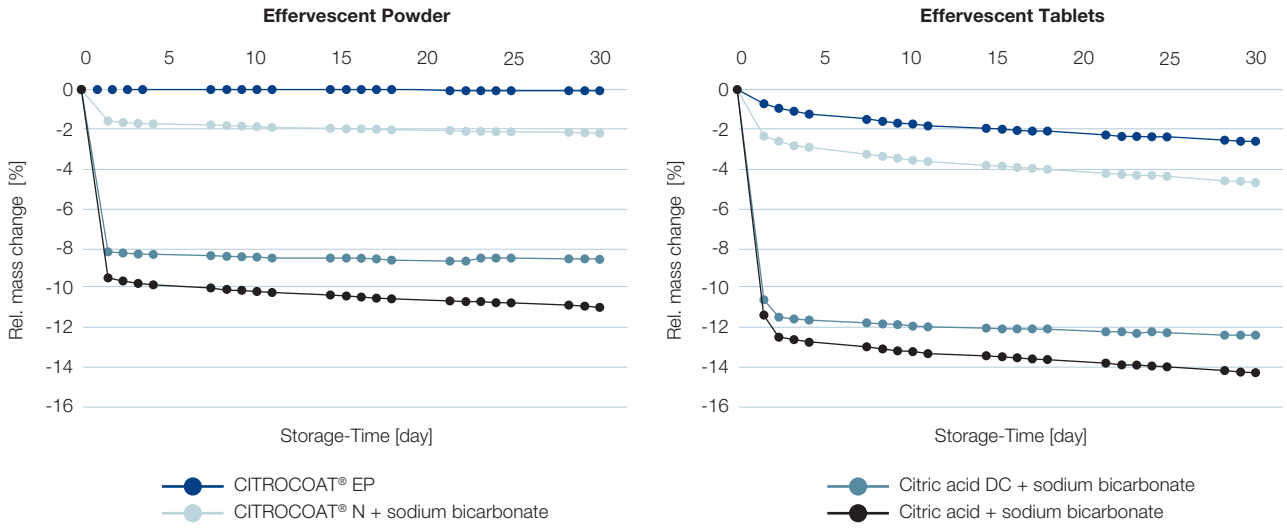

Figure 1: Relative mass change (in %) over time (in days) of either effervescent hand mix (ratio 1:1) or CITROCOAT® EP in powder and tab format (open storage at 30ºC, 50%rH)

Tableting

Tableting is a complex process that involves many different factors and poses a variety of challenges for many manufacturers. Citric acid DC is a direct compressible form of citric acid that helps manufacturers save time and energy during the tableting process and results in significantly improved tablets in terms of hardness and friability.

As an agglomerated effervescent compound, CITROCOAT® EP offers similar benefits, providing a ready-to-use effervescent solution with the major advantage of a lower segregation risk while processing the material.

The additional agglomeration step linked to a binder helps ensure an optimised ratio of the components and improves the compressibility of the compound.

Both products make it possible to reduce the compression force, increasing production output without compromising on tablet hardness or friability. This furthermore results in less damage and stress to production equipment.

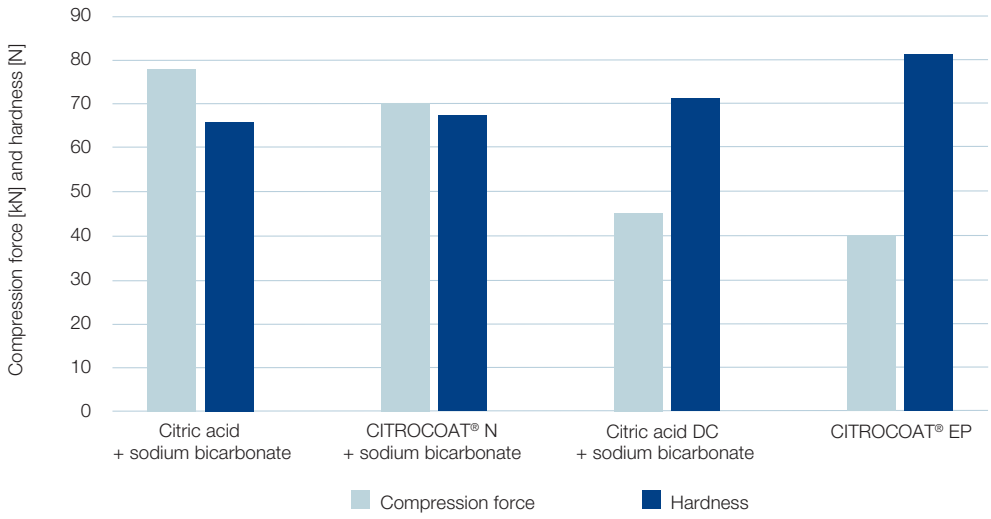

Figure 2: Analysis of tablet hardness with samples containing either effervescent hand mix (ratio 1:1) or CITROCOAT® EP (tablet mass 5 g, n = 10)

Jungbunzlauer Group

Jungbunzlauer is represented in all major markets. Our global network of sales companies and distributors covers more than 130 countries.

North America

Europe
(incl. Africa and Middle East)

Latin America

Asia & Pacific

- SALES OFFICE
- PRODUCTION SITE
- PRODUCTION SITE / SALES OFFICE
- APPLICATION TECHNOLOGY CENTER

Jungbunzlauer is a world leading producer of biodegradable ingredients of natural origin. The Swiss-based, international company's roots date back to 1867. Today, Jungbunzlauer specialises in citric acid, biogums, gluconates, lactics, specialties, special salts and sweeteners for the food, beverage, pharmaceutical and cosmetic industry as well as for various other industrial applications.

Jungbunzlauer's products are manufactured using natural fermentation processes, based on renewable raw materials.

All our products can be used, transported and disposed of in a secure and ecologically safe way. The Group operates manufacturing plants in Austria, Canada, France and Germany.

A worldwide network of sales companies and distributors with a thorough understanding of target markets and client requirements underlies Jungbunzlauer's strong market and customer focus. Committed to its rigorous quality standards, Jungbunzlauer guarantees for the excellence and sustainability of its products and services.

Headquarters **Jungbunzlauer Suisse AG**
4002 Basel · Switzerland · Phone +41 61 295 51 00 · headquarters@jungbunzlauer.com · www.jungbunzlauer.com