

JOST CHEMICAL®

It's in the Details

Jost Chemical Develops Technology for High-Purity Calcium Salts

Jost Chemical Company has developed a new technology for manufacturing ultra-pure calcium salts with very low levels of aluminum, lead, manganese, iron and other vagrant metals.

This technology offers a step change in calcium purity with levels that can be 25 to 50 times lower than materials produced using current technology.

"This important breakthrough allows us to produce calcium salts with purity levels that were not previously achievable," says Jeff Lenger, Director of Sales and Marketing for Jost Chemical. "Our customers are excited about this ultra-pure calcium because it makes it possible for them to develop new products and to improve the quality of their existing products."

Many companies are looking for a reliable source of consistent, high-purity chemicals. "Lot selecting" raw materials is not an effective method for meeting stringent purity requirements and offering a commercial product based on materials that may not be consistently available is not a viable option. Jost's proprietary technology addresses these issues by providing high-purity materials that consistently meet the needs of demanding applications.

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"Variations in raw materials do not play a significant role in our technology since these are controlled through our process," says Lenger. "Our customers can feel confident that each production run will meet their purity requirements every time."

The first two commercial successes of Jost's high-purity technology were in applications that required low levels of aluminum (Al) and lead (Pb). Aluminum is a known toxin to the nervous system and has been linked to Alzheimer's for many years, though this link is still being researched. As a result of these concerns, there is a significant demand for materials with low levels of aluminum, especially for use in products designed for children and infants.

Until Jost developed its new technology, calcium compounds with extremely low levels of aluminum were difficult to guarantee. At the time, calcium citrate typically carried aluminum levels of approximately 70 to 80 ppm. Now Jost can manufacture calcium citrate with aluminum levels of less than 5 ppm.

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PRODUCT	Pb	Mn	Al
Jost Calcium Citrate			
Specification	0.03 ppm	40 ppm	5 ppm
Typical Results	< 0.03 ppm	< 5 ppm	< 1 ppm
Jost Tri-Calcium Phosphate			
Specification	2 ppm	2 ppm	5 ppm
Typical Results	< 0.5 ppm	< 1 ppm	< 1 ppm
Jost Di-Calcium Phosphate			
Specification	2 ppm	—	10 ppm
Typical Results	< 0.1 ppm	—	< 1 ppm
Jost Calcium Hydroxide			
Specification	2 ppm	1 ppm	50 ppm
Typical Results	< 2 ppm	< 0.1 ppm	< 2 ppm

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After solidifying its position as a market leader in the production of high purity calcium citrate, Jost expanded into tri-calcium phosphate (TCP).

At the time of Jost's entry, TCP manufacturers were only able to commit to an aluminum level of less than 125 ppm. Today, Jost is able to consistently meet levels below 5 ppm, allowing companies to improve the purity and quality of their products. In addition, Jost's high-purity technology opens new markets for companies offering high purity products to infants and children.

Lead content has always been an issue, especially since 1986 when California's Proposition 65 established requirements for labeling potential carcinogens. For many years, Jost produced calcium citrate at an extremely low level of lead with less than 0.2 ppm. Now that the improved technology is in place, Jost can produce materials with lead levels of less than 0.03 ppm, which is virtually non-detectable.

Many companies are beginning to investigate opportunities to reduce other impurities. For example, manufacturers of clinical nutrition products asked Jost to assist in limiting manganese (Mn) levels in TCP. Formulators had detected problems at manganese levels greater than 100 ppm in calcium phosphates when used in applications sensitive to manganese. Jost's proprietary technology allows the production of calcium phosphates with manganese levels consistently less than 2 ppm.

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Jost was able to meet the company's stringent requirements, thanks to its high-purity technology, which allows Jost to consistently manufacture TCP with very low manganese levels.

In another example, a company was developing a drink that contained ascorbic acid. They needed materials with extremely low levels of iron because ascorbic acid is susceptible to oxidation when in contact with iron, even at low levels. Jost was able to meet these demands by producing calcium citrate and calcium hydroxide with much lower iron levels than other available products.

Jost's improved technology can be applied to the manufacture of any calcium salt. In addition to calcium citrate, tri-calcium phosphate, and calcium hydroxide, Jost is in the process of developing ultra-pure forms of calcium carbonate and di-calcium phosphate.

"We have been surprised by the interest level from companies outside the pharmaceutical industry, which is our primary target market," says Lenger. "We've learned that there are a wide range of applications for these high-purity calcium salts." He notes that many companies are looking for ways to avoid impurities that could interfere with their manufacturing processes. "Our market has expanded to include electronics, lighting, laboratory reagents... basically any application area with stringent purity requirements."

