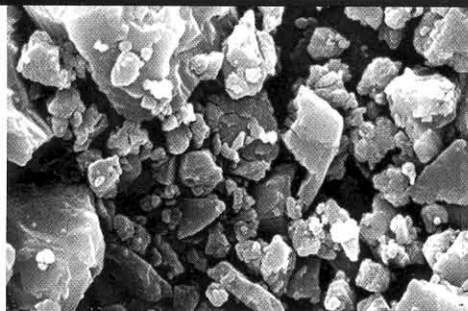
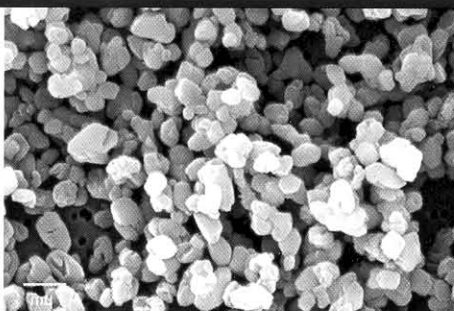


Smooth Calcium Fortifier

Kerry Hughes, Technical Field Editor



Ground Calcium Carbonate



Precipitated Calcium Carbonate

In response to the ongoing controversy over which type of calcium supplementation is best, a team of researchers looked at absorbability and effective cost comparison of various forms. The results, published in the *Journal of the American College of Nutrition*, found calcium carbonate's bioavailability was equivalent to the citrate form. When taking cost into consideration, this study showed, calcium carbonate becomes the optimal supplementation form for many applications.

Beyond nutrition and cost, other factors come into play in choosing a calcium form with desirable attributes of taste, texture and color. Some calcium forms on the market are gritty and may also give foods off-tastes. Ground calcium carbonate may be as fine as $4\mu\text{m}$, but more typically is between $8\text{--}12\mu\text{m}$.

One product that has overcome this barrier is ViCALity Albalfil® precipitated calcium carbonate (PCC) by Specialty

Minerals Inc. SEM photos compare ground calcium carbonate's undefined crystal structures and large size distribution to ViCALity Albalfil PCC's prismatic (barrel-shaped) crystal structure and narrow particle size distribution.


is reacted with water to form calcium hydroxide, allowing heavy metals and other impurities to separate out. Calcium carbonate is reformed in a precipitation process by reaction with carbon dioxide.

Specialty Minerals' precipitated calcium carbonates are available in 14 different grades, varying by particle size and shape. Precipitated calcium carbonate has several crystal habits—from acicular or needle-like to rhombohedral barrels or cubes—that provide different functionality. Scanning Electron Micrograph (SEM) photos compare ground calcium carbonate's undefined crystal structures and large particle size distribution to ViCALity Albalfil PCC's prismatic (barrel-shaped) crystal structure and narrow size distribution.

These ViCALity Albalfil PCC attributes are important in the manufacture of applications requiring smooth mouthfeel such as ice cream, frozen yogurt, flavored milk beverages, soymilk, liquid meal supplements and infant formula. In these applications, the ingredient is undetectable by the consumer and, due to its excellent suspension stability, does not settle.

According to a study by Heaney RP, et al. (2001. Absorbability and cost effectiveness in calcium supplementation. *J Am Coll Nutr.* 3:239-46), calcium carbonate also is the

most economical form of calcium supplementation. Less is needed as a percent of a formulation in that the ingredient has the highest elemental calcium (40%) of any calcium form on the market. At just 0.5g per serving, it allows products to declare they meet 20% of the RDA for calcium or that they are an "excellent source of calcium."

ViCALity precipitated calcium carbonate grades also are GRAS and kosher, allowing for both direct and indirect food additive use. 

For more information:

Specialty Minerals, Melanie Snyder
610-882-8705 • melanie.snyder@mineralstech.com
www.mineralstech.com

Less is More

(Weight needed for 1,000mg elemental calcium)

Compound	% calcium	Grams needed	Weight vs. CaCO_3
Calcium carbonate	40.9	2.5	—
Calcium citrate	21.0	4.8	1.9 X
Calcium gluconate	8.9	11.2	4.5 X
Calcium lactate	13.0	7.7	3.1 X
Monocalcium phosphate anhydrous	17.1	5.8	2.3 X
Monocalcium phosphate	15.0	6.3	2.5 X
Dicalcium phosphate anhydrous	29.4	3.4	1.4 X
Dicalcium phosphate dehydrate	23.2	4.3	1.7 X
Tricalcium phosphate	38.0	2.6	1.1 X

Source: Specialty Minerals Inc.