

Reactions

► Letters to the editor

Honey and bees

A fan of Newsprints, I could not help but notice the photo of “blue” honey in the July 3 issue of C&EN (page 40). It looks a lot closer to Wolfpack red (a brand color of North

The caption for this photo in Newsprints asked if this type of honey, which comes in purples and blues, could signal support for Duke University or the University of North Carolina.

Carolina State University) than Carolina or Duke blue (brand colors

of the University of North Carolina and Duke University). Even accounting for the possibility of poor photographic reproduction, purple is not a color associated with either Duke or UNC. I say it's closer to Wolfpack red!

**Bryan J. Gentsch
Goldthwaite, Texas**

I'm writing about Laurel Oldach's “The Buzz about Town” story. Loved it! Newsprints is always my first stop when I crack open a new issue of C&EN!

Interesting about the products observed in hive debris. But perhaps it is not only scientists and honeybees that are collaborating. It seems that in Venice, Italy, the wood rot fungus might be collaborating with the honeybees too: bees spread spores, and the fungus helps bees fight viral infections.

For more on this, have a look at Stamets et al. (*Sci. Rep.* 2018, DOI: 10.1038/s41598-018-32194-8), which describes how fungi extracts can significantly reduce levels of apian viruses. It seems that bees deliberately

forage fungi! I first learned about this work in Merlin Sheldrake's *Entangled Life: How Fungi Make Our Worlds, Change Our Minds, and Shape Our Futures*. It's a great book and worth a read.

Keep up the great work!

By the way: Regarding the June 19/26 editorial (“What's the Right Frequency for C&EN?”), I am one of the folks for whom C&EN is the reason for keeping American Chemical Society membership at premium level. I love my print copy and always turn right to Newsprints!

**Rose Pesce-Rodriguez
Elkridge, Maryland**

Silicas in toothpaste

The Synthetic Amorphous Silica and Silicate Industry Association would like to offer a correction to the July 10 C&EN article “What's That Stuff? Toothpaste Tablets” (page 20). The silicas commonly

Features

CONSUMER PRODUCTS

What's that stuff? Toothpaste tablets

Originally a niche product for the zero-waste crowd, these pressed powder pills are the latest in a string of popular tooth-cleaning options

CHRIS A. BERTHOLDNER, C&EN STAFF

Dried organic silicates have recently received more formal marketing for a share of the oral hygiene market. Toothpaste tablets are dry, pressed powder pills about the size of an aspirin or a pill. With a solid chew from the motion, the tablet turns into a powder that mixes with saliva to make a slurry paste.

From there, the procedure is what most people are used to: brush all surfaces of the teeth and rinse for about a 30-sec playthrough of “Weird Al's” song “Weird New World,” about eight times after a quick pass on the tongue and roof of the mouth, spit, rinse and spit.

As of June 2023, toothpaste tablets cost 40 to 60 cents per three-month supply and are sold in a variety of sizes and shapes, some associated with tubes of conventional

toothpaste. But countless products are available in the personal care market, and with more than 100 variations to choose from, brands may be wondering: “What exactly are toothpaste tablets?”

Despite very subtle, but an easy-to-regular toothpastes, the tablet formulation usually employs abrasives to slough off stains and debris, surfactants to help wash away food and grime, binders to hold the formulation together, and sweeteners and flavorings for taste.

A sample formulation from the personal care ingredient supplier Jungholdner details that approach. The first ingredients, weighing in at about 40% of the total, is

sweetener. Jungholdner's choice is a blend of sugar alcohol sorbitol and several glycerides derived from the sweet potato. Other mouth-salt sources might use xylitol, sorbitol, and mannitol, as well.

In addition to improving taste, the sweetener component serves as a binder, helping the tablets hold together until it's time to brush. Sugar alcohols such as xylitol, sorbitol, and mannitol are very hygroscopic, so they won't soak up humidity from the air and cause the tablets to become brittle, which is why they're used.

Some research also suggests that xylitol fights tooth decay by making it harder for bacteria to adhere to teeth, though the American Dental Association (ADA) has not yet endorsed this specific claim. Other mouth salts, such as calcium hydroxide, where glycerol, sorbitol, and sorbitol make up a larger percentage of the formula. Sweetener ingredients such as xylitol, sorbitol, and mannitol are more common in tube toothpastes, though sugar alcohols are commonly in the formulator's standard palette.

The most surfactant in the sample formulation is cocamidopropyl betaine, a water-based surfactant in the personal care industry. But you don't need much—merely 1% in many recipes.



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formulated into toothpastes are synthetic amorphous forms, not crystalline. The silica particle morphology is manipulated in a way that commercially relevant silicas do not cause excessive tooth wear and at the same time provide adequate removal of the pellicle (the clinical benefit). In terms of tooth wear, there are two main parameters: abrasivity toward enamel and abrasivity toward dentin. The abrasivity toward dentin is

measured and controlled by the silica manufacturers to provide a safe product. Authoritative bodies like the American Dental Association have restrictions on how abrasive a toothpaste can be in order to keep teeth healthy for a lifetime use of toothpaste.

**Joel F. Carpenter, executive director of the Synthetic Amorphous Silica and Silicate Industry Association
Baton Rouge, Louisiana**

Thallium and hair loss

Thank you for the article on thallium poisoning (C&EN, July 17, 2023, page 13). It reminded me of the third edition (1972) of F. Albert Cotton and Geoffrey Wilkinson's *Advanced Inorganic Chemistry*, which states (page 280), “Thallous solutions are exceedingly poisonous and in traces cause loss of hair,” with a reference not to a toxicological publication but to Agatha Christie's *The Pale Horse* (1961).

**Frank Kroh
Marion, Ohio**

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