

March 17, 2013

National Organic Standards Board
USDA-AMS-NOP
1400 Independence Ave. SW., Room 2648-S, Mail Stop 0268,
Washington, DC 20250-0268

Re: Sulfuric Acid

Members of the NOSB,

Perhaps the most useful and widely used substance listed at §205.605(s) is citric acid. It would be very desirable to have this substance commercially available in organic form.

Citric acid historically was isolated from lemons. Currently, most citric acid is produced by fermentation of carbohydrate substrates by non-GM microorganisms. It is totally feasible for the production of citric acid in either of these biological systems to be organic. The problem comes in the isolation and purification of citric acid to the purity required for food use.

The citric acid isolation/purification process is very simple and was defined by the Swedish chemist Carl Wilhelm Scheele in 1784. First one adds calcium hydroxide to mashed lemons or the fermentation medium to precipitate citric acid as calcium citrate. After separating the precipitated calcium citrate, one adds sulfuric acid to neutralize the calcium hydroxide, yielding insoluble calcium sulfate (the mineral gypsum) and soluble citric acid. Repeat this procedure a few times and one achieves pure citric acid.

Calcium hydroxide is an allowed substance on the National List at §205.605(b). However, sulfuric acid is not on the National List, so contacting sulfuric acid with organic citric acid would cause the citric acid to lose its organic integrity.

When you consider the petition for allowing sulfuric acid as a processing aid on the National List, please bear in mind that adding sulfuric acid to the National List is an absolute requirement for producing organic citric acid.

Incidentally, the comment in the Handling Subcommittee recommendation that "The TR notes that sulfuric acid is a substantial source of acid rain," is totally irrelevant to the affirmed GRAS food substance sulfuric acid listed at 21 CFR 184.1095.

Acid rain is caused by burning sulfur-containing fuels – high sulfur coal, high-sulfur petroleum – and producing sulfur dioxide, which reacts with the oxygen in air to form

sulfur trioxide. If the sulfur trioxide is not trapped with limestone (calcium carbonate) to form insoluble calcium sulfate and instead is released to the environment, it reacts with water to form (sulfuric) acid rain.

The manufacturing operation producing sulfuric acid has both economic and environmental incentives to release as little sulfur oxides to the environment as possible.

Sincerely,

Richard C Theuer

Richard C Theuer, Ph.D.

Member, National Organic Standards Board – 1992-1995