

TRIS AMINO™ AC TROMETHAMINE BUFFERS

New, Advanced Crystals for Improved Handling and Preparation

A LONG-STANDING INDUSTRY CHALLENGE

Clumping during transport and storage is a common and challenging characteristic of conventional TRIS buffer products. There are a number of inefficiencies that can be associated with clumping of TRIS buffers, such as increased operating costs related to staff time required to de-clump product as well as longer hold times due to slower buffer solution processing. The time spent by manufacturing personnel to manually break apart aggregates of TRIS buffers and extend mixing can delay processes, reduce productivity and create operational bottlenecks.

WHY IT HAPPENS

TRIS is a hygroscopic material. It absorbs moisture, and the degree to which clumping, or "caking," occurs is partially dependent on environmental and/or storage conditions, such as humidity, compression, temperature cycling and the duration in which these influences act on the material. Clumping is generally found as aggregates mixed in with powder but can also result in formation of solid blocks. Depending on shipping times and conditions, conventional TRIS buffers commercially available in the market can often arrive with clumping. This can also occur subsequently during storage or when drums or bags are opened and resealed during routine dispensing operations.

AN INNOVATIVE SOLUTION FROM ANGUS

To address handling challenges with TRIS buffers currently available on the market, ANGUS Chemical Company developed the next generation TRIS AMINO™ AC Advanced Crystals. TRIS AMINO AC buffers are manufactured exclusively by ANGUS using proprietary process technology, and are less prone to clumping and hardness – without any change to the molecule itself. ANGUS created a material solution to the clumping problem with a unique crystal morphology for TRIS AMINO AC buffers that has a larger, more rounded particle structure and does not typically form strong cakes even when subjected to a variety of packaging, shipping and storage conditions. TRIS AMINO AC buffers may provide critical operational benefits when it comes to handling and preparation:

- Low interparticle cohesion between crystals requires less energy to break up clumps
- More spherical crystals allows for improvements in dispensing and transport through conveyors
- Lower dust emissions due to fewer fine particles
- No additives or anti-clumping agents

LARGER SIZE, FEWER FINE PARTICLES, SMOOTHER SURFACE = LESS CLUMPING



Conventional TRIS crystal structure*



TRIS AMINO AC Advanced Crystals from ANGUS*

TRIS AMINO AC ADVANCED CRYSTALS ARE ROUND AND SMOOTH COMPARED TO COMPETITIVE MATERIALS CURRENTLY AVAILABLE ON THE MARKET



Conventional TRIS crystal structure



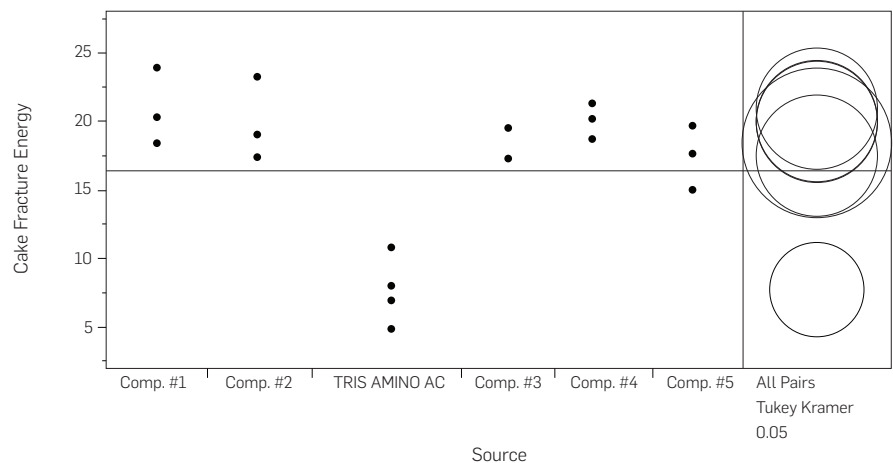
TRIS AMINO AC Advanced Crystals from ANGUS

The unique morphology of TRIS AMINO AC buffers helps reduce cake strength resulting in less clumping and hardness than competitive materials.

LESS ENERGY IS REQUIRED TO BREAK APART AGGLOMERATES OF TRIS AMINO AC CRYSTALS THAN THAT REQUIRED FOR COMPETITIVE MATERIALS

After 25 days exposure to high humidity and elevated temperatures, TRIS AMINO AC crystals maintain measurably lower cake strength compared to only two days' exposure for competitive products.

One-way Analysis of Energy by Source



PRODUCT STEWARDSHIP

ANGUS encourages its customers to review their applications of ANGUS products from the standpoint of human health and environmental quality. To help ensure that ANGUS products are not used in ways for which they are not intended, ANGUS personnel will assist customers in dealing with environmental and product safety considerations. For assistance, product Safety Data Sheets, or other information, please visit angus.com or contact us at info@angus.com.



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