

Evaluating the Effectiveness of Lancaster Products K-Series High Shear Counter-Current Mixers in Ceramic Processing

In typical ceramic processing applications, mixing / milling is performed using processes such as ball milling, which is a lengthy and energy-intensive process, often requiring processing times as long as 12 - 24 hours.

Could you achieve similar mixing in far less time?

A Simple Study

- Mix the components of a solid state reaction system and evaluate phase composition, particle size, and homogeneity (not shown here) of the heat treated powders (calcium carbonate and titanium dioxide.)
- Compare ball milling at set increments (3,6,12, and 24 hours) with powder sampled from the K-series mixer at shorter times (30 min. or less.)

Conclusions

Comparable mix quality and reduction in particle size in 10 to 20 minutes of mixing in a high shear, counter-current mixer yielded similar results as 3 to 6 hours of ball milling time.



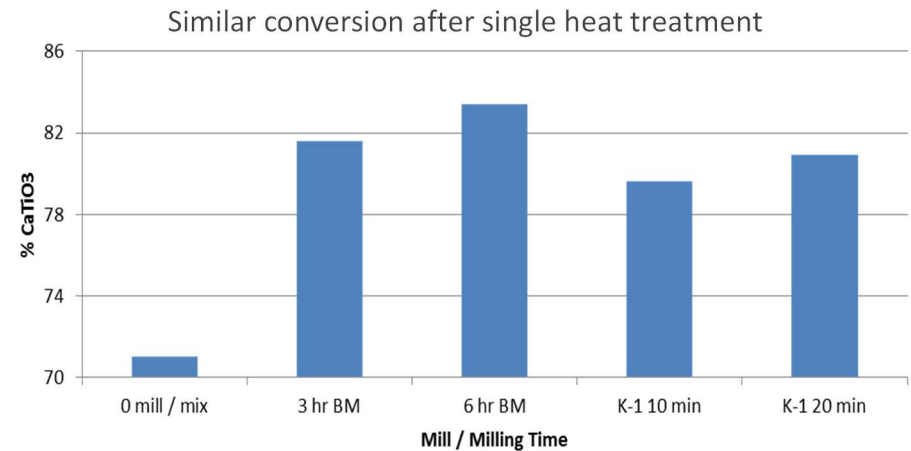
This project was a collaboration between Lancaster Products and H & M Analytical Services (www.H-and-M-Analytical.com) under the leadership of Steve Mercurio, PhD.

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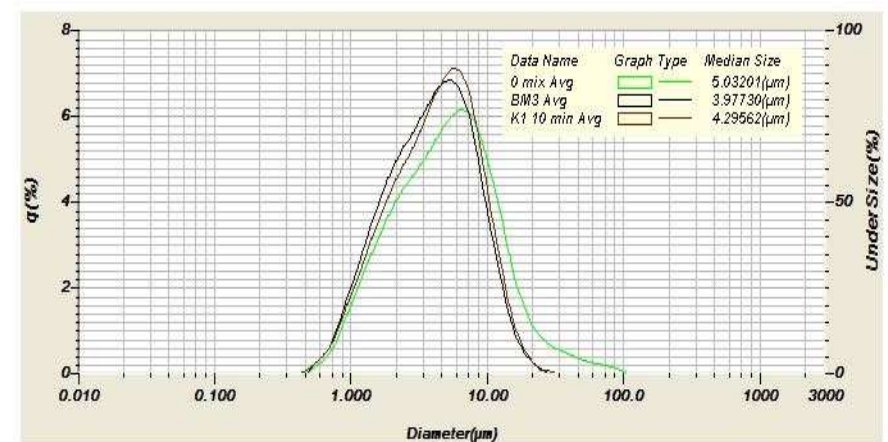


Phase Composition Results

% CaTiO₃ Yielded



Particle Size Results



- Starting powder mix median 5.02 µm
- K1 10 min – 4.29 µm
- Ball mill 3 hrs – 3.98 µm