

“Monodispersed Ceramic Processing Revisited”

In 1970, FH Norton published a book entitled, “Fine Ceramics, Technology and Applications,” to introduce processing science and engineering to a ceramics community that was operating generally on art and technique. WD Kingery updated his 1960 textbook, “Introduction to Ceramics,” in 1976 adding even more depth to the science of ceramics processing. Soon after as a result of an advisory team recommendation from ceramic technology industrial leaders, MIT Professor H. Kent Bowen commenced a decade-long investigative program throughout the 1980’s that redefined ceramic processing. Multidisciplinary studies and results from colloidal science, thermodynamics, geometric models, sintering theory and characterization were brought together to better understand and improve the properties and manufacturing of ceramics. The theorem was to perfect the pre-firing stages of ceramics processing to increase yield and precision in the final component at a net savings in cost. Ceramic powders with almost perfect sphericity and uniform size were prepared, cast in close-packed arrays, and sintered. This work tested traditional and new models, often resulting in novel properties; the presenter has made a career in ceramics powder processing from what was learned and what stemmed from MIT’s CPRL. Thirty years later, much of what was developed during this period is now being applied to nano-powder processing with great promise.