REACTIVE FLASH SINTERING

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Recently, it was found out that Flash Sintering could be used not only for sintering materials but also for inducing Solid-State reactions. Both processes take place almost simultaneously. The first reported example of this type of reactive Flash Sintering was the preparation of single-phase, dense nanostructured $BiFeO_3$ ceramics from a mixture of f Bi_2O_3 and Fe_2O_3 powders. The process took place in seconds at a furnace temperature of about 625 °C with an electric field of 50 V cm^{-1} [1]. The procedure has been extended to more complex compositions such as $BiFeO_3$–$BaTiO_3$ ceramic materials [2]. Moreover, the topic has grown significantly and it has been successfully extended to ferroelectric, multiferroic, piezoelectric, high entropy oxides, solid state ionic conductors, etc [3]. This field is a hot topic in ceramic processing with a significant potential for obtaining functional ceramics, counting complex oxides that are difficult to obtain for more conventional procedures, particularly for materials that have low melting and volatile compounds or that yield unwanted intermediate compounds. Besides, reactive Flash Sintering reduces the consumption of both energy and time when compared with conventional ceramic processing.

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