

Subsecond Thermal Processing Using Flash Lamps for the Nanoscale and Beyond

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Undoubtedly, thermal activation processes in advanced materials technologies underwent a dramatic development during the last 40 years. Especially, the use of lasers and lamps allowed the move from long time (10 min to several hours) to short time (several fs-1 min) annealing approaches. From the application viewpoint, the main driver was semiconductor-based chip technology. After 1980, annealing with halogen lamp arrangements allowed annealing times in the range of 10 min and below arriving in advanced chip technology the limit of about 1 sec around the year 2000. To reach annealing times down to the ns range lasers and xenon-filled flash lamps came on stream. In this talk a short introduction to flash lamp annealing technology will be presented together with a few promising research approaches: dissolution of point defect clusters, doping of 2D materials, lithium battery electrode engineering.