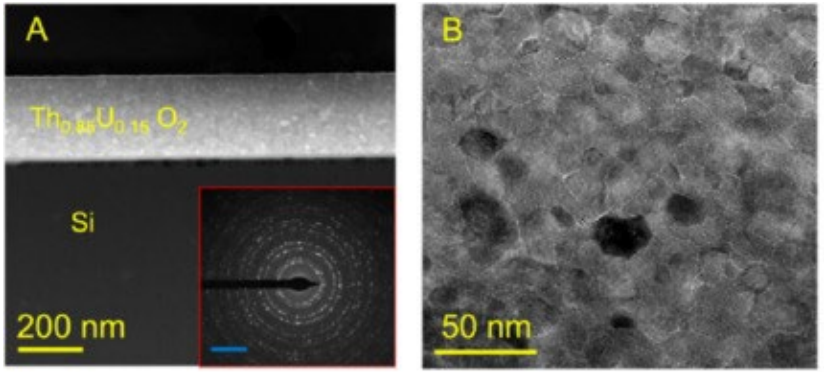
# Next-Generation Materials and Devices

- Combustion synthesis offers energy-efficient approaches to producing advanced materials, ranging from nanopowders and bulk ceramics to functional thin films and devices.

- Fabrication of compositionally controlled thin films and specialized targets, including actinide-containing materials for nuclear physics experiments have been made with Solution combustion.

- This review identifies key opportunities for improving reaction control, microstructural precision, and reproducibility, supporting the development of next-generation materials and nuclear targets.




Irradiation-induced evolution of $Th_{0.85}U_{0.15}O_2$ films after Kr-ion irradiation ($10^{16}$ ions/cm$^2$). (A) Transmission electron microscopy (TEM) image with inset electron diffraction pattern. (B) High-resolution TEM image showing grain growth and well-defined nanocrystals without defect accumulation.

https://www.sciencedirect.com/science/article/pii/S0079642526002045

*Manukyan et al; Next-Generation Materials and Devices by Combustion Processes, Progress in Materials Science (2026).*