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Supporting Information

Responsive charge transport in wide-band-gap oxide films of nanostructured amorphous alkali-gallium-germanosilicate

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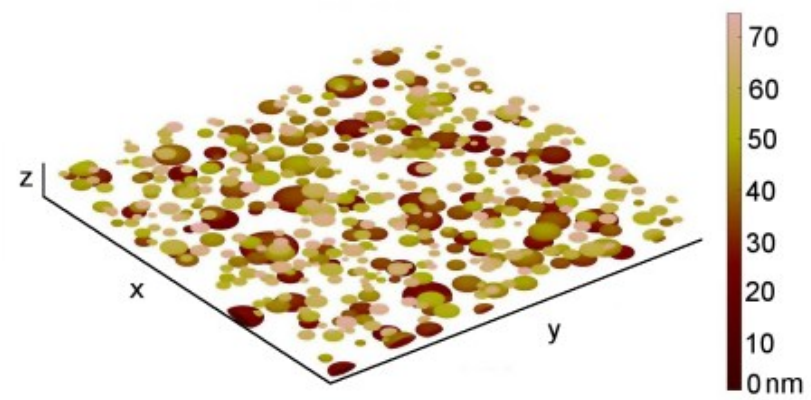

Fig. S1: Isometric representation of an ensemble of nanoparticles of lenticular shape generated by the simulation program. The cell dimension is 1000x1000x70 nm and nanoparticles have a radius/height ratio of 4 and with radii generated by a log-normal distribution centered at 80 nm with a standard deviation of 30 nm.

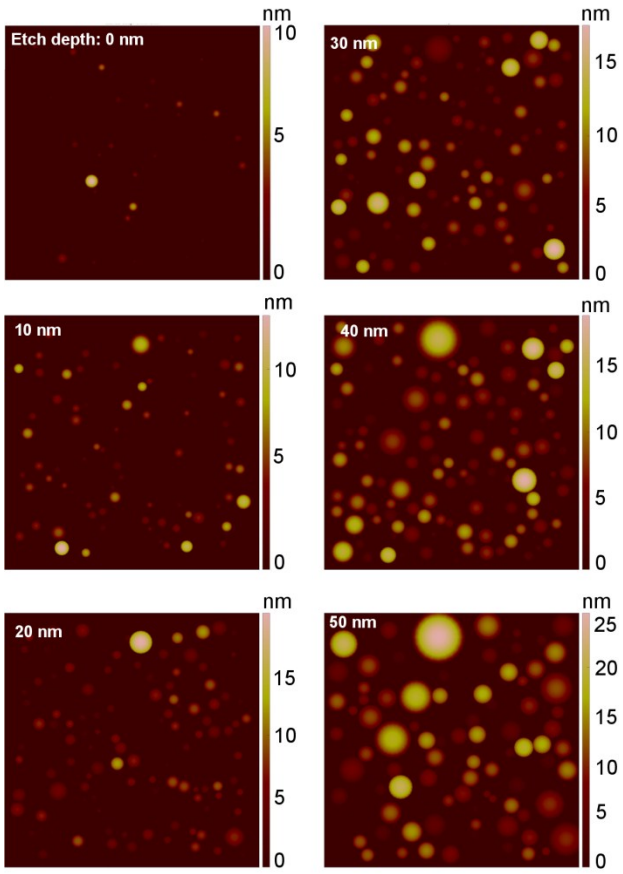

Fig. S2: Simulated etching experiment of a computer-generated system with the same parameters reported in Fig. S1. The experiment simulates the AFM image at different etching depth from the top surface down to 50 nm in steps of 10 nm. The etching is assumed to remove only the matrix and the nanoparticles detach when the surrounding matrix is less than the 20% of the nanoparticle height. AFM image size is 1μm×1μm.

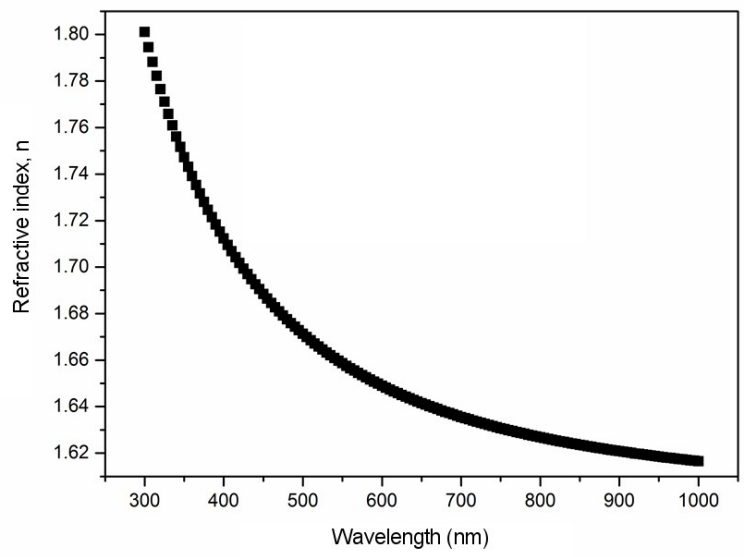

Fig. S3: Refractive index dispersion from ellipsometric measurement of the film on Si substrate. Data best fit was obtained assuming that the film is a perfect dielectric and using a Cauchy's equation.

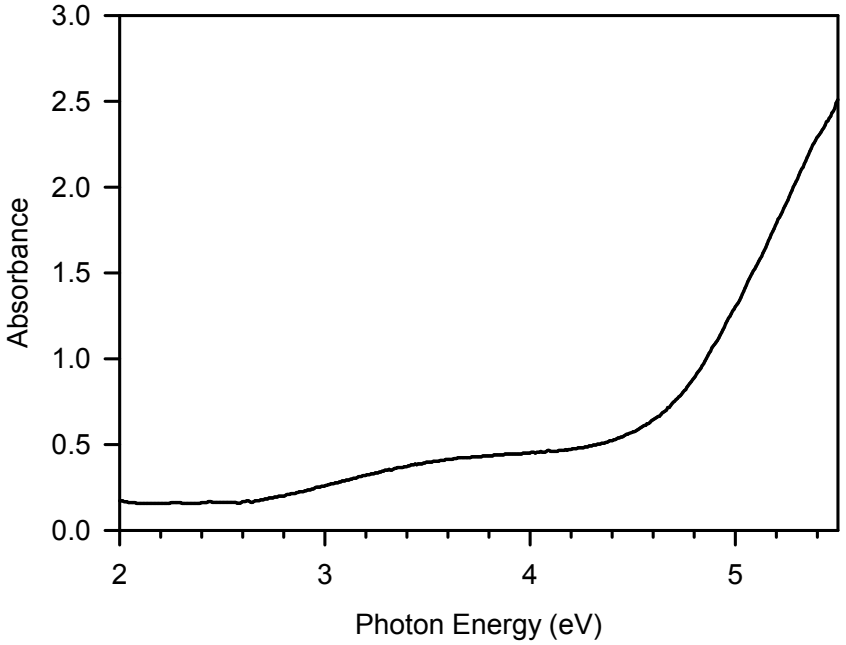

Fig. S4: Absorption spectrum of a thick film of about 1 µm sputtered on a fused silica substrate. The spectrum shows an absorption edge of about 4.3 eV and a defect-related band centered at 3.6 eV.

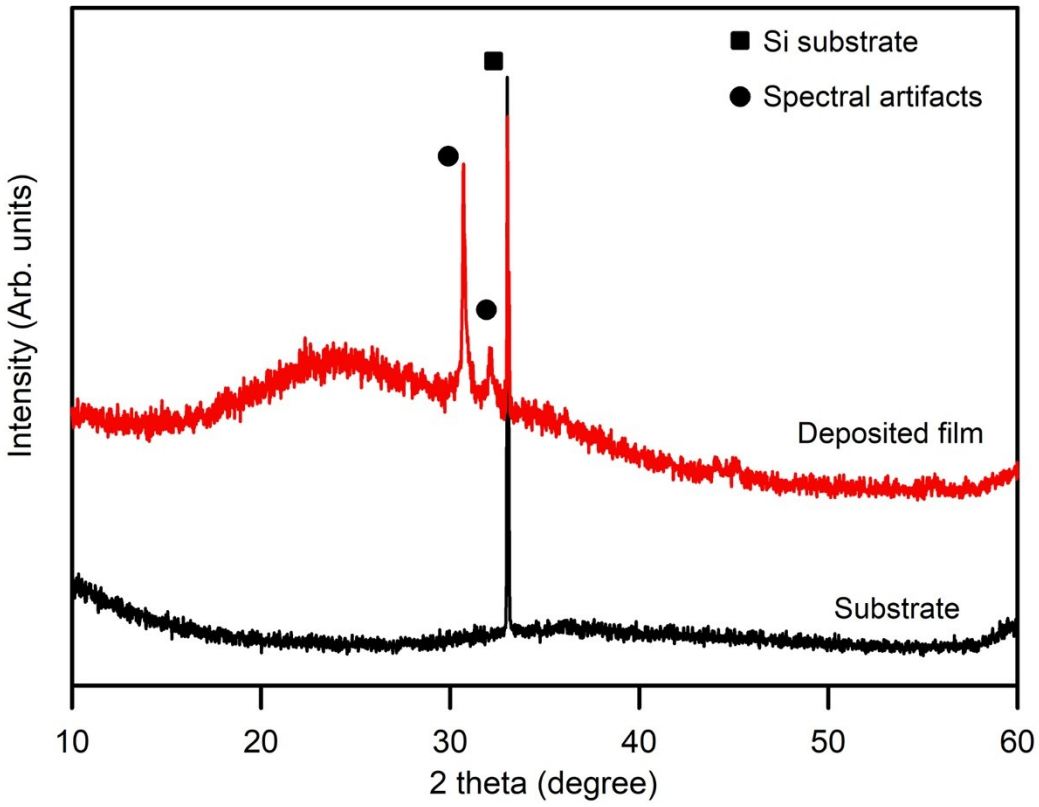

Fig. S5: X-ray diffraction patterns of Si substrate (black line) and RF-sputtered thick film of about 4 µm on Si (red line). Diffractogram of the film shows a broad halo centered from the amorphous phase and minor contributions from the Si substrate (square) and from measurement-dependent experimental artifacts (circles).