

Supplementary information

1. EDX analysis to probe the presence of Mg in the film

To show that the nanorods on top of the compact part of the film also consist of $Zn_{1-x}Mg_xO$, EDX analysis on the cross section of a sample deposited from a 15 mol% Mg solution (solution D) was realized. The film (corresponding to Figure 2(d) in the manuscript), schematically shown in Figure S1, has a compact lower part and a top nanorod part. The sample was tilted as shown in the Figure S1. Two EDX scans were acquired, one at the edge of the cross-section where the nanorods are located (Scan 1) and the other at the opposite edge, at the film/glass interface (Scan 2). Figure S2 shows the EDX elemental analysis of the two scans. Scan 1 contains an intense peak of Al, stemming from the sample holder cladding (see Figure S1)), while Scan 2 contains a Si peak stemming from the glass (plus a weak peak from back-scattered Al from the sample holder). In both scans we see signals from Zn and Mg, which strongly suggests that both nanorods and film contain Zn and Mg.

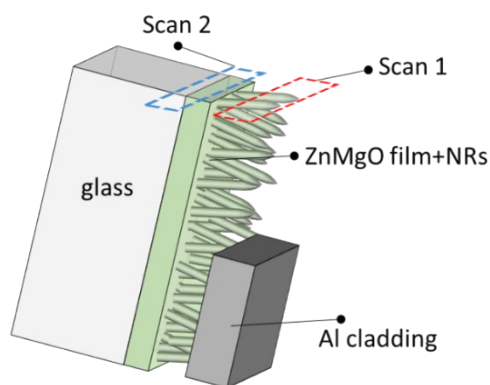


Fig S1 Schematic view on the EDX analysis of $Zn_{1-x}Mg_xO$ nanorods and film

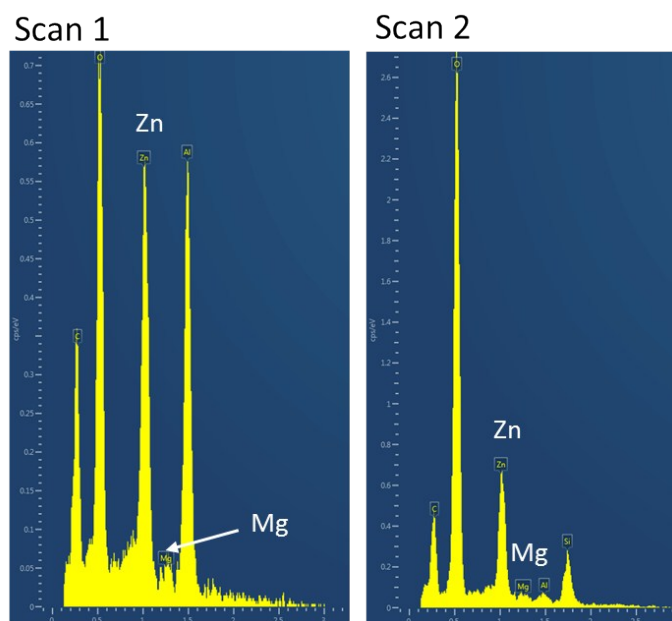


Fig S2 EDX analysis of nanorods (Scan 1) and compact film (Scan 2)