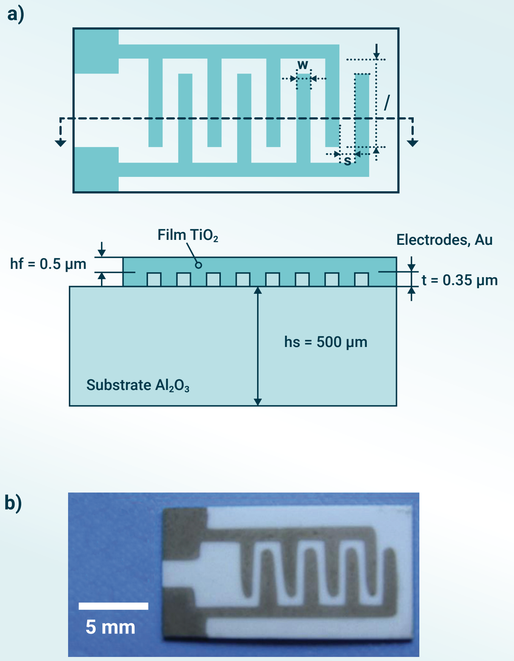
ELECTRICAL AND STRUCTURAL CHARACTERISATION OF NANOSTRUCTURED TITANIA COATINGS DEPOSITED ON INTERDIGITATED ELECTRODE SYSTEM

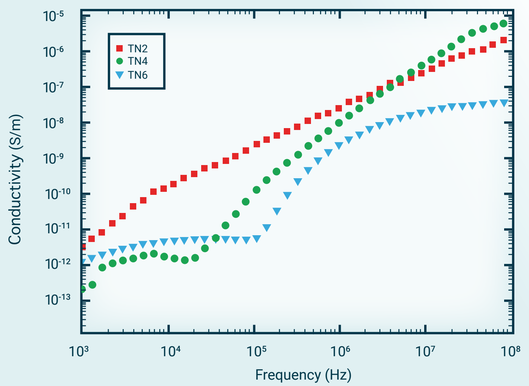
The effect of La3+ and Nb5+ ions on the electrical properties of titanium dioxide coatings is studied. Phase angle, capacitance C and resistance R were measured on the interdigitated samples (like a capacitor), coated with nanocrystalline titania. From these measured data, electrical parameters such as conductivity δ and relative permittivity ε were calculated.

Nanostructured titania coatings were obtained by a sol–gel method, starting from stable and transparent pure titania sol and titania sols with different concentrations of Nb5+ or La3+ ions (x/Ti = 2, 4, 6 at%, where x = Nb or La).

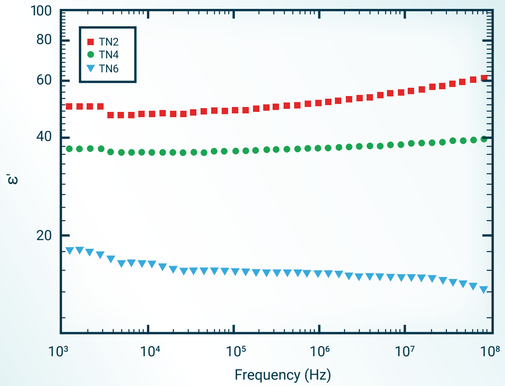
Design of the fabricated interdigitated electrode system:
(a) the cross-sectional view and
(b) the top view.



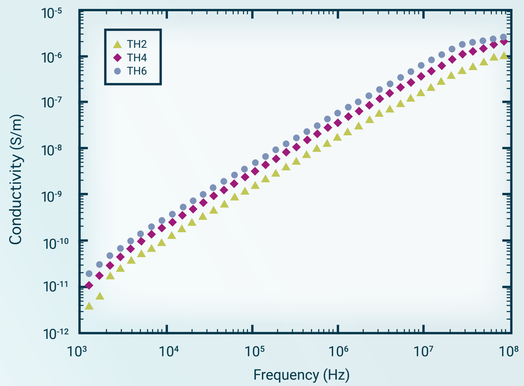
The conductivity as a function of frequency for TiO_2 coatings doped with La.



The real part of complex permittivity as a function of frequency for TiO_2 coatings doped with La.



The conductivity as a function of frequency for TiO_2 coatings doped with Nb.



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