

Supplementary data

Synergistic antimicrobial effect of cold atmospheric plasma and redox-active nanoparticles

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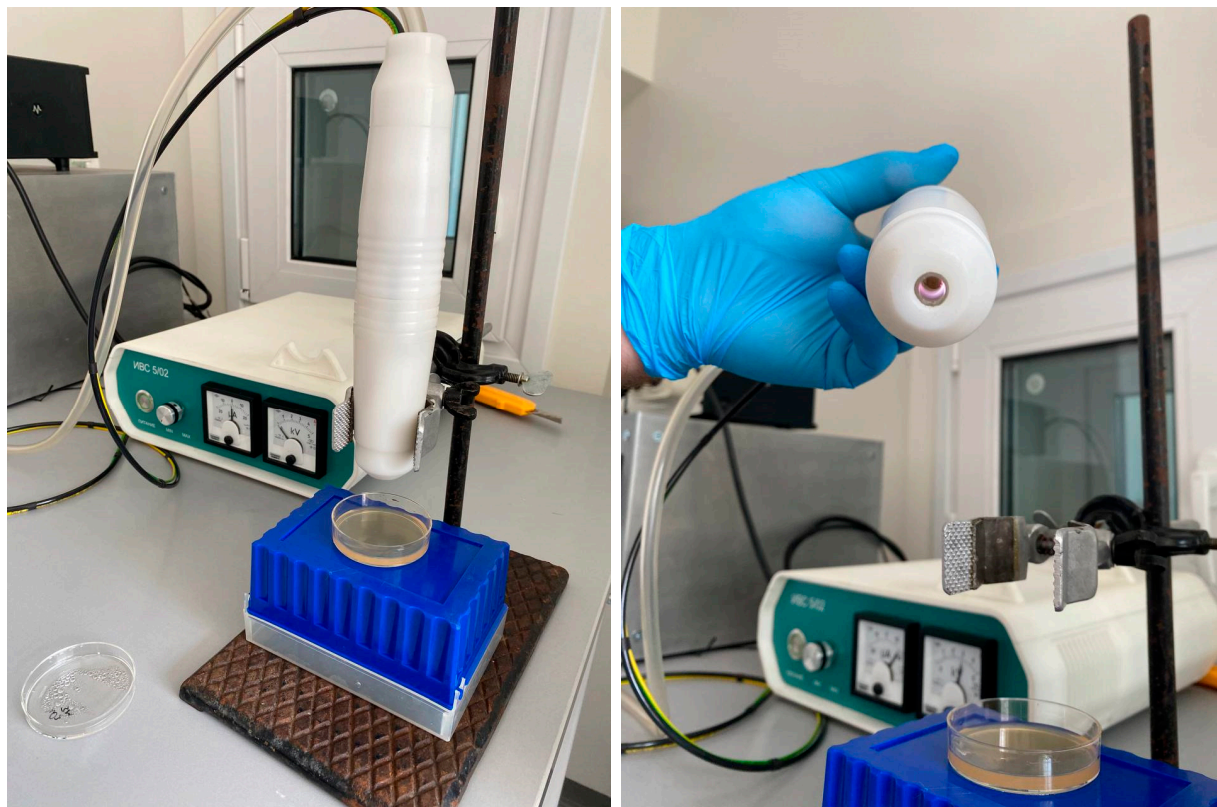


Figure S1. Irradiation scheme with the CAP irradiator (a) and demonstration of the nozzle with the outgoing plasma jet (b).

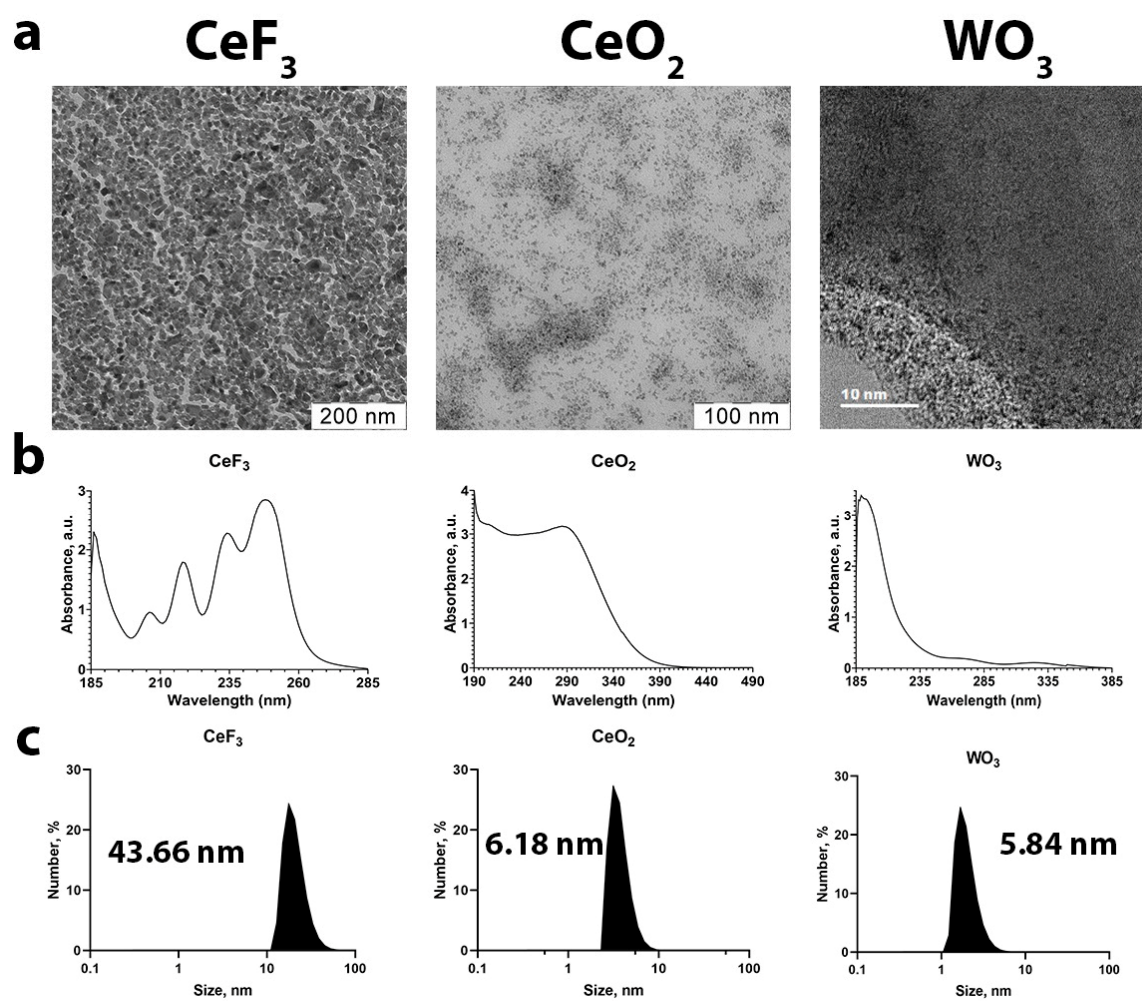


Figure S2. Characterisation of CeF_3 , CeO_2 and WO_3 nanoparticles: transmission electron microscopy (a), UV/visible spectra (b) and hydrodynamic diameters after dilution in distilled water (c).

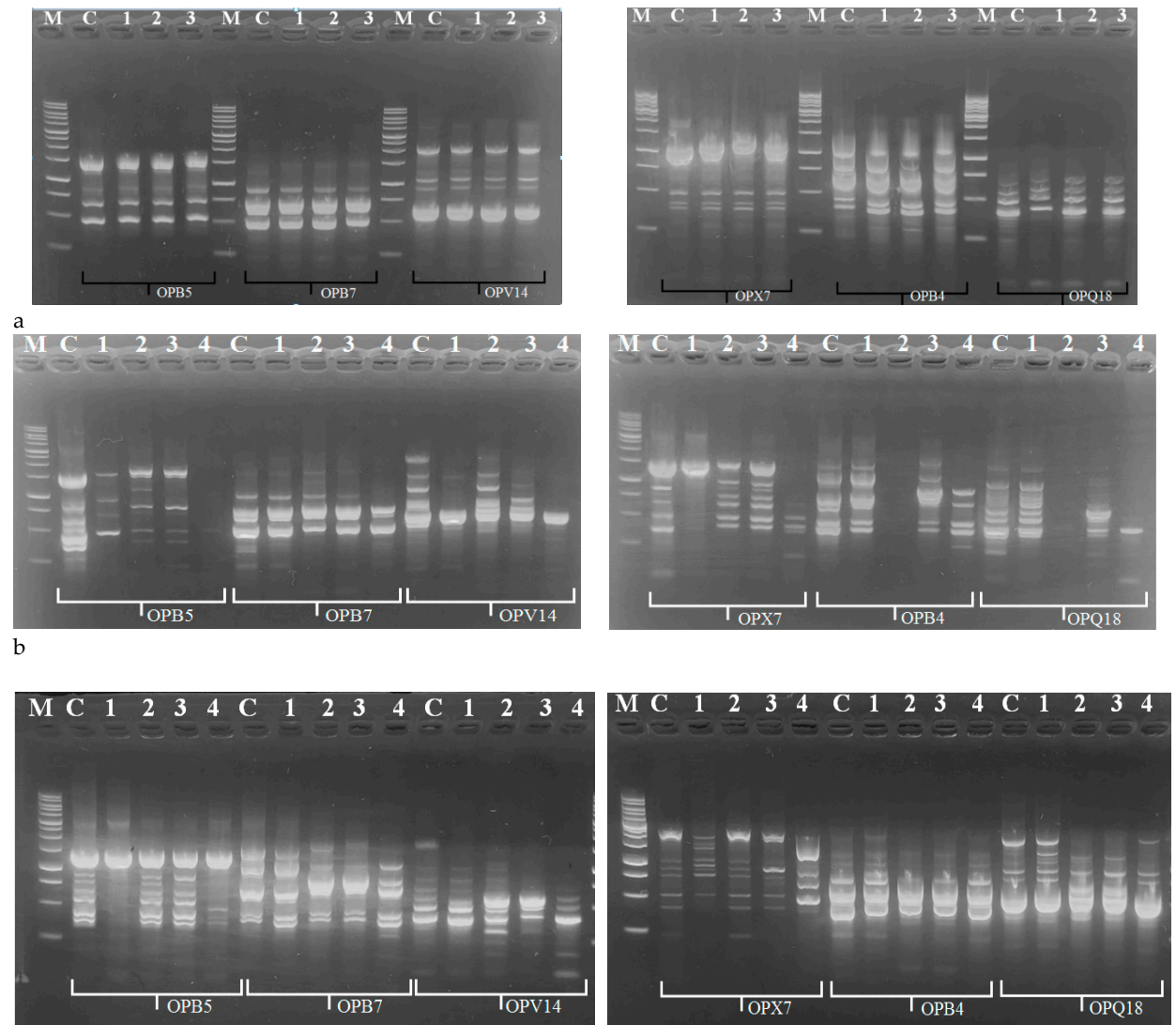


Figure S3. Results of RAPD PCR. a – samples treated with NPs, without CAP exposition. M – marker, C – control without NPs, 1- CeO_2 , 2 - CeF_3 , 3 - WO_3 ; b – samples exposed to 3 min of CAP. M – marker, C – control, 1 – no NPs, 2 - CeF_3 , 3 – CeO_2 , 4 - WO_3 ; c – samples exposed to 6 min of CAP. M – marker, C – control without NPs, 1 –no NPs, 2- CeF_3 , 3 – CeO_2 , 4 – WO_3 .

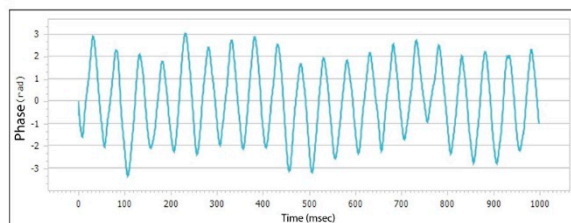
a

Medium: water	Wavelength : 671 nm	Reference intensity : 2916.3 kcps
Viscosity : 0.8936 mPa.s (cP)	Эффективное напряжение: 149.09 V	Stabilisation : 60 s
RI: 1.33	Model : FFR	Number of Sub Runs: 10
Dielectric constant : 78.5755	Cuvette: capillary cuvette	

Results

 ζ - potential : 39.2262 mVElectrophoretic mobility : 3.0539 $\mu\text{mcm/Vs}$

Conductivity : 3.7864 mS/cm

Sample CeF_3 

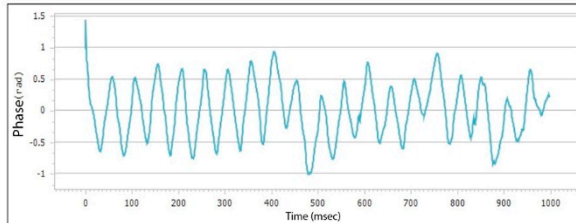
b

Medium: Water	Wavelength : 671 nm	Reference intensity : 2932 kcps
Viscosity : 0.8936 mPa.s (cP)	Effective voltage : 48.81 V	Stabilisation : 60 s
RI: 1.33	Model : FFR	Number of Sub Runs: 10
Dielectric constant : 78.5755	Cuvette: capillary cuvette	

Results

 ζ - potential : -28.7334 mVElectrophoretic mobility : -2.2370 $\mu\text{mcm/Vs}$

Conductivity : 6.4830 mS/cm

Sample CeO_2 

c

Medium: water	Wavelength : 671 nm	Reference intensity : 2848.1
Viscosity : 0.8936 mPa.s (cP)	Effective voltage : 148.96 V	Stabilisation : 60 s
RI: 1.33	Model : FFR	Number of Sub Runs: 10
Dielectric constant : 78.5755	Cuvette: capillary cuvette	

Results

 ζ - potential : -8.1132 mVElectrophoretic mobility : -0.6316 $\mu\text{mcm/Vs}$

Conductivity : 2.6708 mS/cm

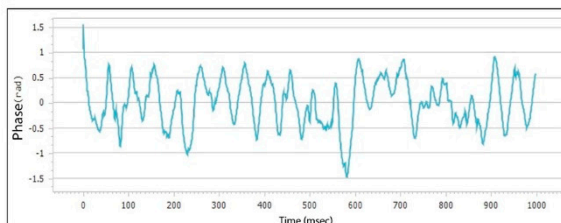
Sample WO_3 

Figure S4. Zeta-potential values of the nanoparticles in distilled water: CeF_3 (a), CeO_2 (b), WO_3 (c).