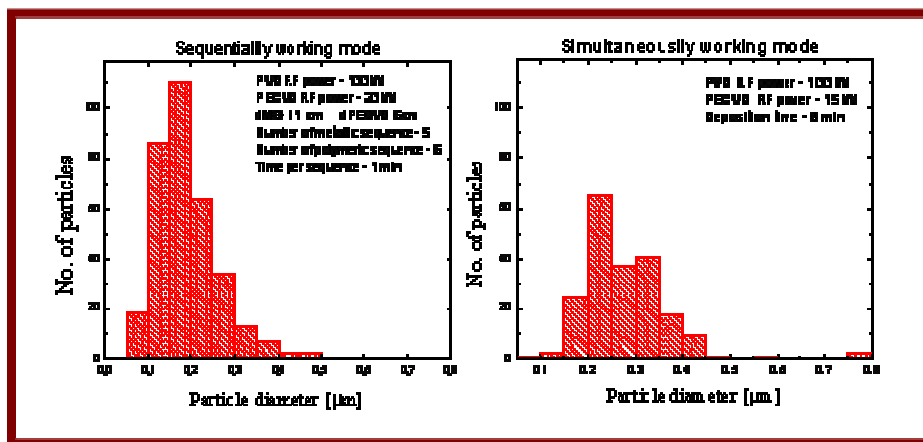
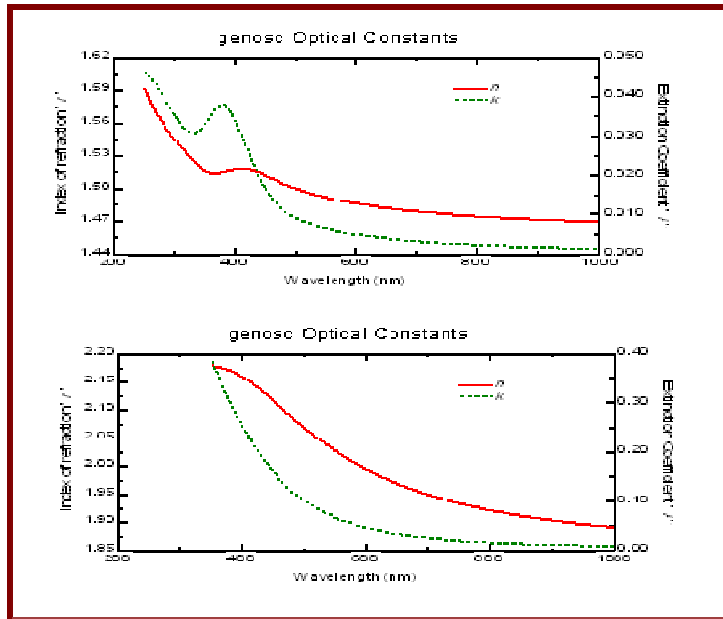


AFM images of the Cu-polysiloxane composites synthesized in sequential (left) and simultaneous (right)



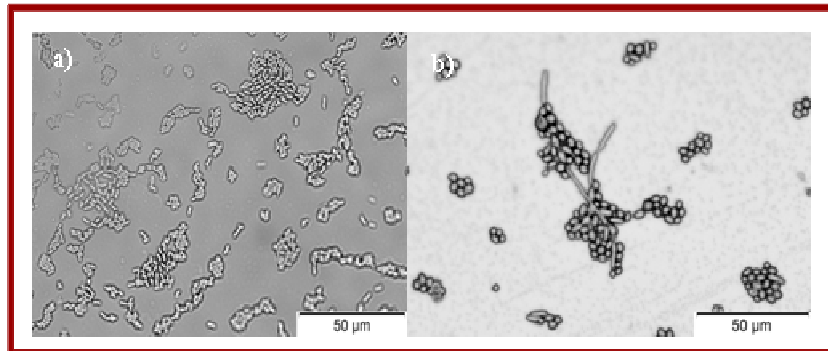
Histogram of particles distribution for the Cu-polysiloxane composite obtained in sequential (left) and simultaneous (right) working modes

- ❖ The number and dimension of particles present on the surface of Cu-polysiloxane materials can be varied by means of the distance to the magnetron plasma source when working in sequential approach, while for the simultaneous approach these depend on the RF power applied on the PECVD plasma source.
- ❖ Histograms of particles distributions for similar working conditions regarding the substrate positioning and RF powers applied to the plasma sources indicate a higher number of metallic inclusions in the polymeric matrix in the sequential working mode, whereas the simultaneous working mode lead to smoother surfaces with much lower Cu content.

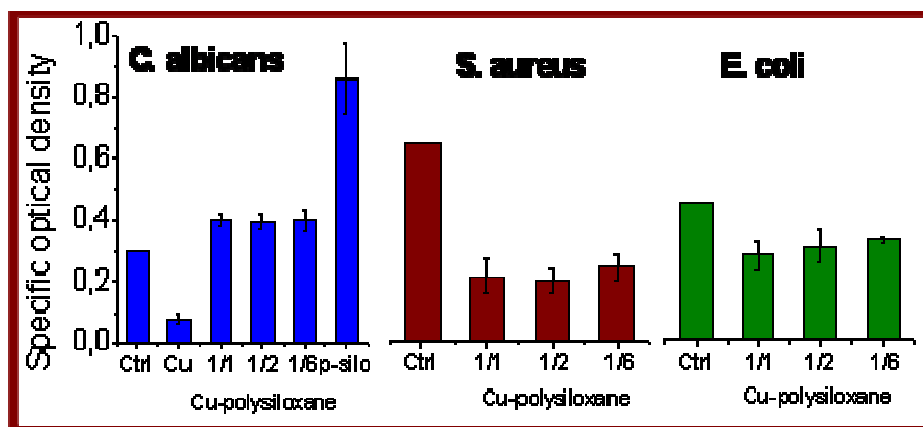


Comparison of the optical properties (refractive index and absorption coefficient) of the Cu-polysiloxane materials obtained upon different metallic exposure time: 10 s (top); 60 s (bottom); exposure time for HMDSO = 60 s in all cases.

- ❖ The Cu-HMDSO composites with lower metallic inclusion ratio presented a clear absorption peak around 380 nm, associated with the surface plasmon resonance effect due to the presence of Cu nanoparticles in the polysiloxane matrix.



Optical images of pathogenic microorganism on the Cu-polysiloxane: *E. coli* (a) and *C. albicans* (b).



0.1OD_{600nm} ⇔ 0.6x10⁷ cell/ml

0.1OD_{600nm} ⇔ 10⁸ cell/ml

Specific optical density for the *C. albicans*, *S. aureus* and *E. coli* microorganisms in contact with Cu-polysiloxane composites, as evaluated after 24

- ❖ Antimicrobial assays (determined quantitatively by means of optical density evaluation OD) evidenced a growth inhibition effect especially for gram positive and gram negative tested strains, and this effect is more pronounced upon increasing the Cu content in the composite material.