

## THE INFLUENCE OF GLYCEROL AND AGAR IN HYDROGEL WITH SILVER NANOPARTICLES

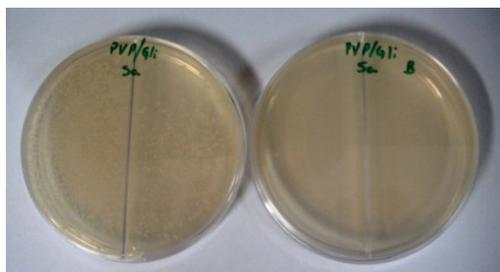
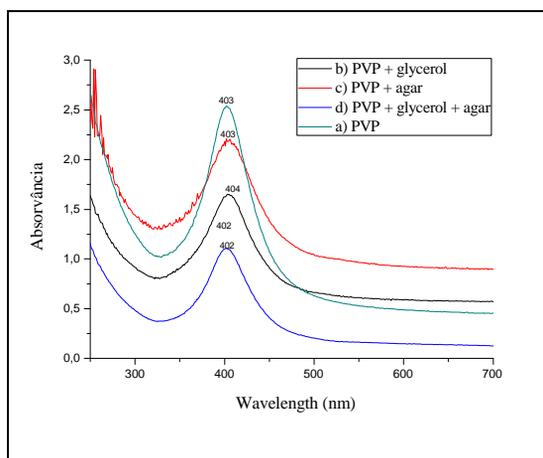
<sup>a</sup>Mara Tânia S. Alcântara, <sup>a</sup>Washington L. Oliani, <sup>b</sup>Nilton Lincopan, <sup>b</sup>Priscila M. dos Santos, <sup>a</sup>Duclerc F. Parra, <sup>c</sup>Humberto G. Riella, <sup>a</sup>Ademar B. Lugão

<sup>a</sup>Nuclear and Energy Research Institute, IPEN-CNEN/SP, Av. Prof. Lineu Prestes, 2242 – Cidade Universitária – CEP 05508-000 São Paulo – SP – Brazil (washoliani@usp.br)  
Institute of Biomedical Science - University of São Paulo – CEP 05508-000 São Paulo – SP – Brazil (lincopan@usp.br)

<sup>c</sup>Federal University of Santa Catarina, UFSC – University Campus – CEP 88040-900 – Florianópolis – SC – Brazil (riella@enq.ufsc.br)

### ABSTRACT

Hydrogels are superabsorbent polymeric materials which play a significant role in health care, especially for wound treatment. Silver nanoparticles (AgNPs) are used in medical application, for their good antimicrobial properties. The objective of this study is to evaluate the possible influence of glycerol and agar in hydrogel properties and in the bacteriological activity of the AgNPs synthesized together with hydrogels, *in vitro*, by irradiation from a Co-60 source. The hydrogels were synthesized from aqueous solutions of a) 12% poly(*N*-vinyl-2-pyrrolidone) (PVP), b) 12% PVP + 1.5% glycerol, c) 12% PVP + 0.75% agar and d) 12% PVP + 1.5% glycerol + 0.75% agar. In sequence 40 ppm of silver nitrate were added to each formulation. The properties of the hydrogel matrices obtained were evaluated from tests of gel fraction, swelling, UV-vis, and bacteriological activity of AgNPs synthesized. Glycerol and agar in PVP hydrogels showed influence on the results of gel fraction and swelling as well as in the synthesis of AgNPs. Figure 1a shows the UV-visible absorption spectrum, whose peaks indicated the formation of silver nanoparticles at different concentrations; Figure 1b shows the results of biological activity of one of the hydrogels obtained.



**Fig. 1 - a)** Plasmon resonance spectra obtained for the hydrogel of PVP, glycerol and agar. **b)** Evaluating of microbial activity test for the same hydrogel against *S.aureus*.

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