

## Coagulation Bath: Morphology Control of Membranes of Nanocomposites Polyamide 6/Clay

R. S. B. Ferreira<sup>1,\*,#</sup>, C. H. Pereira<sup>2</sup>, E. A. S. Filho<sup>1</sup>, A. M. D. Leite<sup>2</sup>, H. L. Lira<sup>1</sup>, E. M. Araújo<sup>1</sup>

<sup>1</sup>Membranes Development Laboratory, Federal University of Campina Grande, Campina Grande – Brazil.

<sup>2</sup>School of Science and Technology (EC&T), Federal University of Rio Grande do Norte, Natal – Brazil.

#Corresponding author: rodholfoferreira@gmail.com

Membranes of polyamide 6 and its nanocomposites with 3 and 5% of clay were obtained by the phase inversion method using distilled water and/or solvent as the coagulation bath, and when 10 and 30% of acid was used, in order to change the morphology/porosity of the membranes. By XRD analysis, the obtained nanocomposites showed an exfoliated and/or partially exfoliated structure, it was also seen two characteristics peaks of the polyamide 6 phases ( $\alpha$  and  $\gamma$ ). For an XRD analysis of the membranes, an exfoliated and/or partially exfoliated structure was evident, as showed at XRD of the nanocomposites, however the formation of the characteristic peak  $\gamma$  of the membrane disappeared, being evident only the peaks  $\alpha_1$  and  $\alpha_2$ . By SEM, it is observed that the PA6 membrane almost does not have pores in its surface, but with an addition of clay had an increase in the quantity of pores of the membrane surface, as the increase in the content of clay. In the cross section of the PA6 membrane, a thin selective layer and a porous support with uniform pores can be found, for the membranes with clay presented a distinct morphology in relation to a thicker selective layer and a better defined porous support. The presence of acid in the coagulation bath, as well as the increase in the acid content, promoted a significant change in the membrane surface. The pure PA6 membrane continued with a structure with few pores. For the membranes of the nanocomposites, there was an increase in pore size and a better uniformity of the pores. In the cross section, the presence of the bath decrease the filtering skin of the membranes, also modifying a uniformity of the pores.