

Title: Nanofiltration for the treatment of coke plant ammoniacal wastewaters

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Abstract: This work addresses the treatment by nanofiltration (NF) of solutions containing NaCN and NH₄Cl at various pH values. The NF experiments are carried out in a Lab-Unit equipped with NF-270 membranes for model solutions that are surrogates of industrial ammoniacal wastewaters generated in the coke-making processes. The applied pressure is 30 bar. The main objective is the separation of the compounds NaCN and NH₄Cl and the optimization of this separation as a function of the pH. Membrane performance is highly dependent on solution composition and characteristics, namely on the pH. In fact, the rejection coefficients for the binary model solution containing sodium cyanide are always higher than the rejections coefficients for the ammonium chloride model solution. For ternary solutions (cyanide/ammonium/water) it was observed that for pH values lower than 9 the rejection coefficients to ammonium are well above the ones observed for the cyanides, but for pH values higher than 9.5 there is a drastic decrease in the ammonium rejection coefficients with the increase of the pH. These results take into account the changes that occur in solution, namely, the solute species that are predominant, with the increase of the pH. The fluxes of the model solutions decreased with increased pH. (C) 2010 Elsevier B.V. All rights reserved.

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