

Atrazine removal from aqueous solutions by nanofiltration

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ABSTRACT

There is an increasing concern about the release of herbicides and other organic compounds to the environment as a result of agricultural activities, due to their high toxicity for living organisms and their difficult to be degraded. Triazines are widely used herbicides that are highly toxic and frequently appear in natural watercourses, atrazine being one of the most commonly detected herbicides in aquatic systems. The atrazine rejection coefficients and the permeate fluxes of different nanofiltration membranes (NF-99, NF-97, Desal-5-DL and Desal-5-DK) for the removal of atrazine from water solutions in different operating conditions (feed atrazine concentration, pressure and pH) are studied in this article. Atrazine rejection was greater with the NF 99 and NF 97 membranes (90–98%), while the DL and DK membranes show much lower rejections (40–50%). The highest permeate fluxes are obtained with NF-99 and DL membranes. Atrazine rejection and permeate flux show no dependence on the atrazine feed concentration, low dependence on pH and a high positive dependence on pressure (especially the permeate flux). The results are explained by taking into account different solute parameters and membrane properties that affect the nanofiltration process.

Keywords: Nanofiltration; Atrazine removal; Rejection; Permeate flux

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