

CHEIKH, A., GRIB, H., DROUCHE, N., ABDI, N., LOUNICI, H., MAMERI, N.

Water denitrification by a hybrid process combining a new bioreactor and conventional electrodialysis

(2013) Chemical Engineering and Processing: Process Intensification 63 PP. 1 - 6

doi: [10.1016/j.cep.2012.11.004](https://doi.org/10.1016/j.cep.2012.11.004)

ABSTRACT:

A feasibility study of an innovated denitrification process is achieved in this present work. It consists of a combination of the electrodialysis (ED) and the Column of Immobilized Biomass on Granular Activated Carbon - CIBGAC. In order to perform the electrodialysis process, the influence of various parameters such as current intensity, chloride, and sulphate concentrations were estimated.

Therefore, an optimum efficiency of the denitrification for an applied current intensity value of 50. mA was obtained. The competition between the chloride and nitrate ions was encountered using the electrodialysis process inducing a slow electromigration of the nitrates. In contrary, the presence of sulphate ions had no influence on the electrodialysis during the denitrification. On the other hand, the biological denitrification of brines by electrodialysis was carried out. A clear decrease of pH was observed from 7.5 to 6.2 and the monitoring of the nitrate and nitrite ions through the bio-compartment affirmed the efficiency of this process. The successful establishment of the hybrid denitrification process was realized. Indeed, the treated water in dilute compartment was in conformity in terms of nitrates concentration and even more the concentrations of different ions are below the amounts recommended by the World Health Organization (WHO). TOHOH he brine solution after biological treatment agrees with WHO standards in terms of nitrate and nitrite ions