



Title: Bentonite used as Adsorbent Agent of the Coupling Adsorption Ultrafiltration of the Secondary Effluents for their Reuse

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Abstract: This present study has for principal objective to treat secondary effluents of the Staoueli purification plant (Algeria) with the average characteristics in the Chemical Oxygen Demand (COD) is 76 mg L^{-1} and 16 NTU of turbidity by adsorption ultrafiltration coupling for its reuse in irrigation or in industry to reduce the water demand. A mineral ultrafiltration tubular membrane of CARBOSEP M2 (15 Kg mol^{-1}) in dynamic mode with a transmembrane pressure $D P = 1 \text{ bar}$ and a cross flow velocity $U = 3 \text{ m sec}^{-1}$ was used for this purpose. The adsorbent choice was made on an Algerian bleaching ground: the bentonite available on the market with low cost. It has sorptives properties and ions exchange with specific area $250 \text{ m}^2 \text{ g}^{-1}$. In the first step, we considered the organic matter adsorption on bentonite in static mode (jar test). The optimal conditions were determined corresponding to the best elimination of the Chemical Oxygen Demand with a final value equal to 30.6 mg L^{-1} and turbidity, in jar test with 1.5 NTU value for an optimal bentonite concentration equal to 10 g L^{-1} . In the second step, the adsorption ultrafiltration coupling, showed a final value in COD equal to 9.2 mg L^{-1} and final turbidity equal to 1.2 NTU. An improvement of the permeate flux was showed equal to 48.8% for the optimal concentration bentonite 10 g L^{-1} . The adsorption significantly improves the ultrafiltration performances.