



## Filtration properties of membranes with active graphene oxide layer

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### ABSTRACT

Filtration properties of membranes obtained by deposition of a few layer graphene oxide onto a polyamide support, with and without borate treatment, were examined. Filtrations of water, dilute solutions of electrolytes ( $\text{Na}_2\text{SO}_4$ ,  $\text{NaCl}$ ,  $\text{MgSO}_4$ ,  $\text{MgCl}_2$ ), and dyes (bromophenol blue, eriochrome black T) were performed. It was found that the observed electrolyte retention series ( $\text{Na}_2\text{SO}_4 > \text{NaCl} > \text{MgSO}_4 > \text{MgCl}_2$ ) was in accordance with the Donnan exclusion theory. The membrane treated with borate and of higher graphene oxide load showed higher retention of sulfates than the untreated one. Despite of lower molecular weight, eriochrome black T was practically completely rejected by both types of membranes, contrary to bromophenol blue, irrespectively of its form (undissociated – retention 68%, dissociated – 85%).

*Keywords:* Nanofiltration; Graphene oxide; Hydrodynamic permeability; Electrolyte retention; Dye retention

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