

# Impact of modified coal with organic layer on the performance of reverse osmosis heterogeneous asymmetric Cellulose Acetate Membranes

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Kosovo's lignite coal particles were tethered with alkyl or mixed alkyl-aryl layers by diverting the reactivity of aryl radicals, derived from aryl diazonium salts, with alkyl halides. [1] The modification is performed in aqueous acid medium when a mixture of aryl diazonium salt and alkyl halide compound of 20 mM concentration with or without using a chemical reducing agent. [2] The presence of organic layer is attested by Attenuated Total Reflectance Fourier-Transform Infrared (ATR-FTIR) spectroscopy which revealed the presence of characteristic groups of used compounds. [1] Modified coal is used to prepare cellulose acetate heterogeneous asymmetric reverse osmosis membranes. The morphology of such membranes is characterized with Scanning Electron Microscopy, SEM. [3] Measurements of different membrane parameters were made in an aqueous solution of sodium chloride as a referent system of feed concentration  $c = 6.8 \times 10^{-3} \text{ mol dm}^{-3}$  at 1.763 MPa. Heterogeneous asymmetric membranes prepared with modified coal have shown much better performance regarding reverse osmosis parameters: increased permeability, rejection capability, product rate, and solute separation as well. The modification procedure of coal particles with organic layer in aqueous acid solution can be easily implemented and may be widely applicable in water treatment and desalination.

*Key words:* Modified coal particles, alkyl and mixed alkyl-aryl layer, heterogeneous asymmetric membranes.

## References

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