MONITORING OF MEMBRANE PROCESSES WITH FLUORESCENCE MOLECULAR PROBES

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This work discusses the use of molecular probes that change their fluorescence response in the presence of different local environmental conditions. In particular, probes able to respond to temperature and to oxygen concentration were identified and used to report the value of these parameters at a molecular scale.

The development of a stable, reproducible and sensitive molecular probing system was then applied to monitor oxygen concentration at the surface of different membrane materials and also in order to obtain oxygen concentration profiles inside dense membranes.

Ultimately, a temperature sensitive probe was used to measure temperature at membrane surfaces making possible its measurement locally. This technique was applied with success to experimentally measure temperature polarization in membrane distillation processes, on-line, in a non-invasive mode.

Future developments of molecular probing will be also presented and discussed.