Glucose transport through supported liquid membranes using noncyclic synthetic receptors

Nidhi Joshi*, Rushikesh Roy, Anubhuti Awasthy, Sangya Dubey, Uma Sharma
School of Studies in Chemistry and Biochemistry, Vikram University, Ujjain (M.P.), India- 456010
Email: nidhiseema@rediffmail.com
Received 21 September 2009; accepted 13 January 2011

A B S T R A C T

A series of redox switched anthraquinone substituted receptors (R1–R4) have been synthesized and used as a carrier for transport of glucose through supported liquid membrane system using different membrane supports, i.e. egg shell, PTFE and dialysis membrane. These membranes were impregnated with receptors using chloroform as a solvent. The efficacy of different receptors for glucose transport through egg-shell, PTFE and dialysis membrane was found to be R1 > R4 > R2 > R3. It is found that the receptor R1 shows maximum amount of glucose transport with egg-shell membrane. Effects of various parameters such as concentration of glucose, concentration of receptors and the nature of supported membranes have been studied. The objective of the present study is to investigate the carrier ability of the receptors (R1–R4) with different membrane supports (egg-shell, PTFE and dialysis). Upon investigating the best membrane amongst all, egg-shell membrane is found to be the best membrane support. Altering the structure of receptors (R1–R4), this can be correlated to QSPR that helps in fabrication of glucose sensors.

Keywords: Glucose Transport; Supported Liquid Membrane; Receptors; Glucose Recognition

*Corresponding author