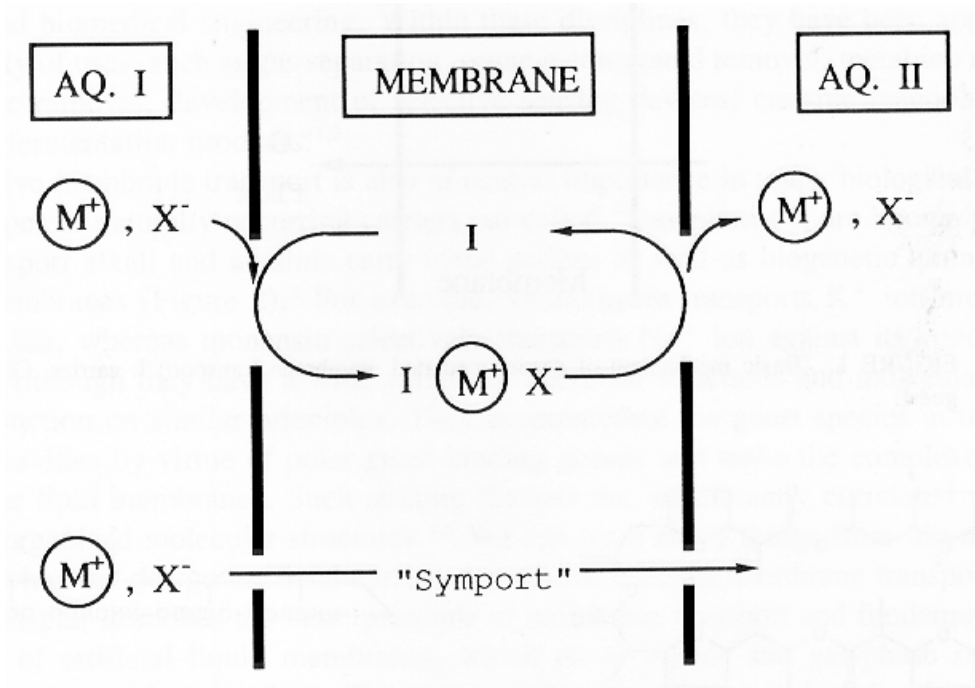
• Liquid Membranes

I am not going to walk you through basic transport phenomenon now, but it is good to know that there are four basic types of transport systems, each of which has its own mechanisms and carrier types. In each of these systems, the one big item to notice is that regardless of mechanism, the complexes formed are that *charge-neutrality must be maintained*. Now then, the four systems are :

- Cation Transport
- Anion Transport
- Neutral Guess Transport
- Switchable Transport

• Liquid Membranes (Cation-SYMPORT)

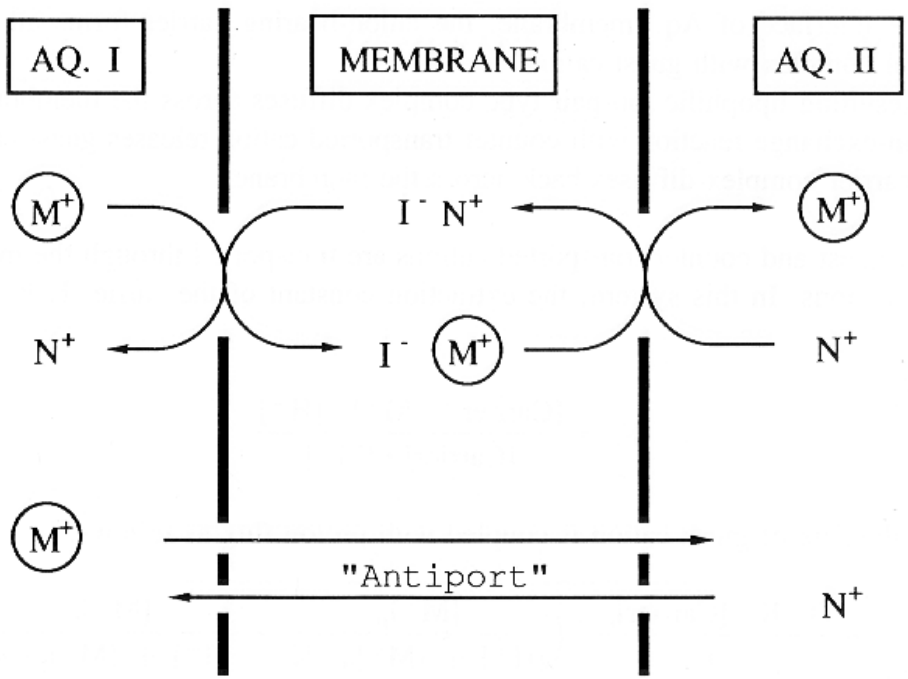
1.At the Phase I interface of the membrane, the guest salt is complexed with the carrier.
2.That complex diffuses across the membrane.
3.The release of that guest salt occurs at the Phase II interface of the membrane.
4.The carrier diffuses back across the membrane, ready to continue.



$$\frac{dC}{dx} = \frac{K\,[Carrier]\left(\dfrac{[M(II)]}{1+[M(II)]\,K} - \dfrac{[M(I)]}{1+[M(I)]\,K}\right)}{L}$$

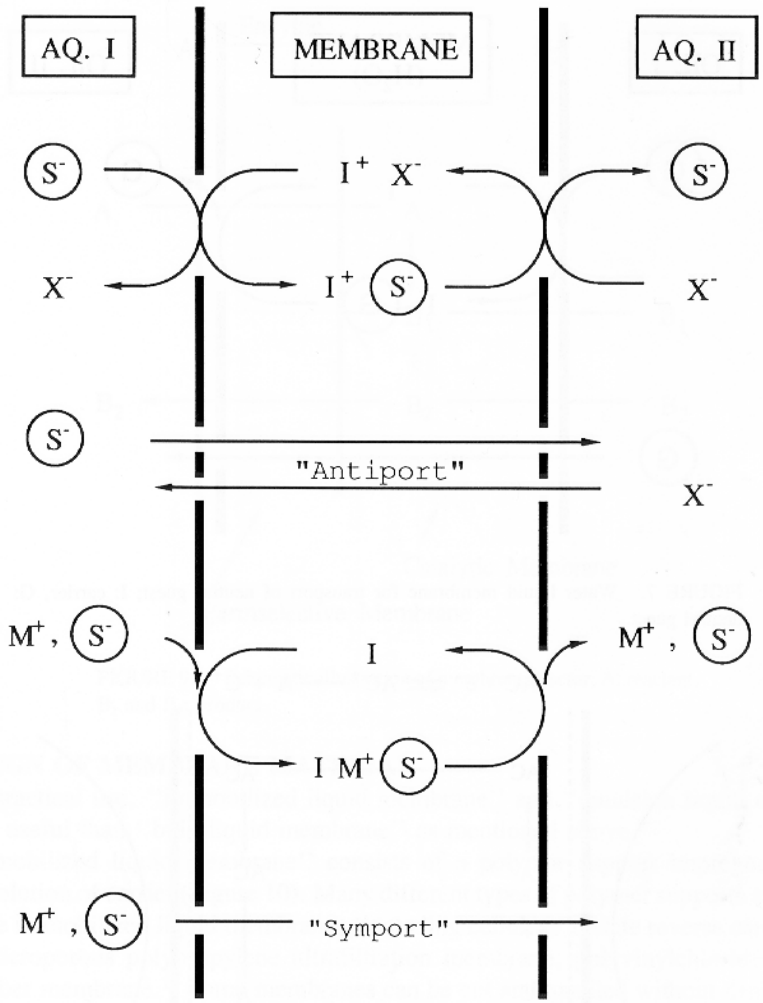
• Liquid Membranes (Cation-ANTIPORT)

1.At the Phase I interphase, the carrier tries to form a neutral complex with the guest cation.
2.The ion-pair diffuses across the membrane.
3.Cation-exchange reaction releases the guest cation to Phase II.
4.The carrier complex with the counter-transported ion diffuses back across the membrane.



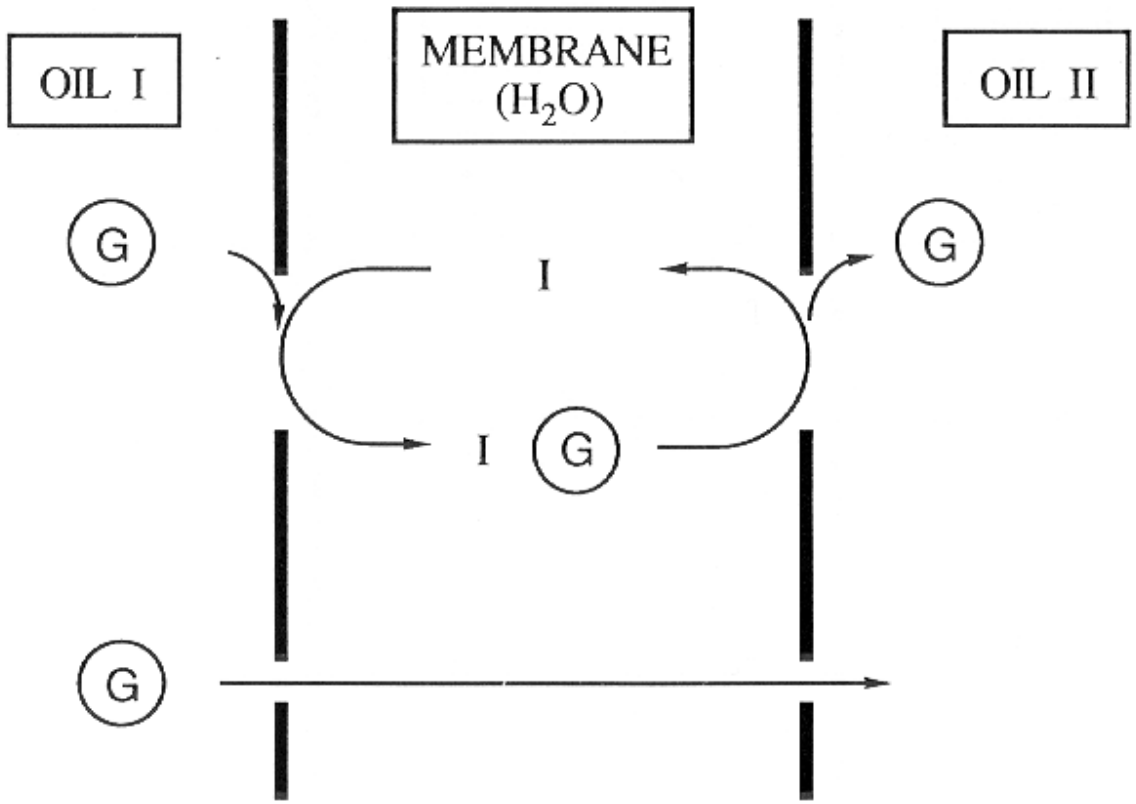
$$\frac{dC}{dx} = \frac{K\,[Carrier]\left(\dfrac{[M(II)]}{[H]+[M(II)]\,K} - \dfrac{[M(I)]}{[H]+[M(I)]\,K}\right)}{L}$$

- Liquid Membranes (Anion transport)



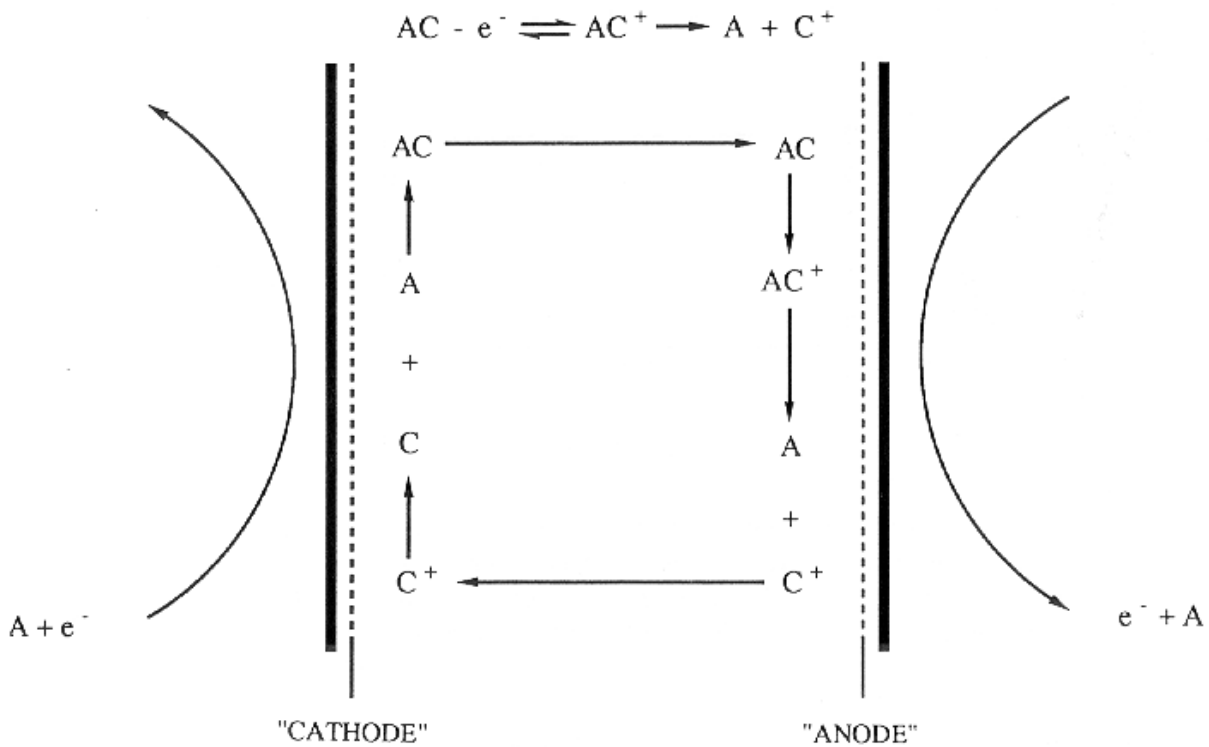
- Liquid Membranes (NEUTRAL)

Neutral species are transported symport, using various carriers



- Liquid Membranes

The use of photo- and electrochemistry has recently been investigated into increasing the rates at which the carrier complexes dissociate, which would, therefore, increase the transport rate

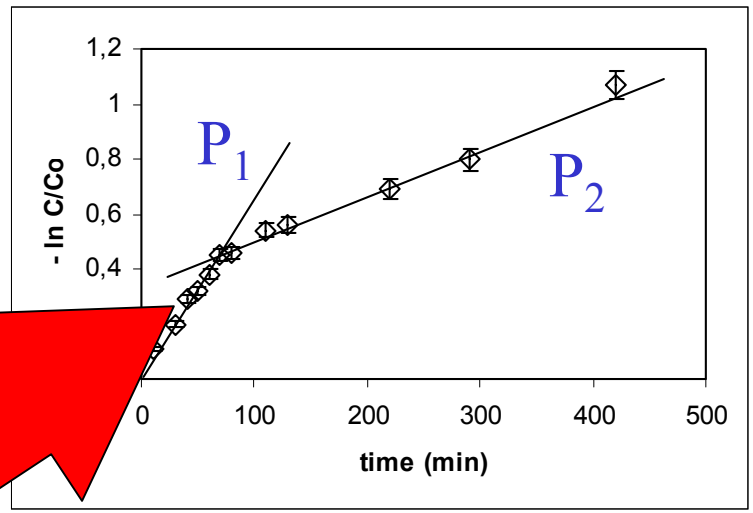


- Liquid Membranes

Permeability calculations in liquid membranes

$$P = \frac{-dC}{C}\frac{1}{dt}\frac{V}{A}$$

$$-\ln\frac{C_f}{C_{fo}} = \frac{A}{V}Pt$$



Slope corresponds to A·P/V, and so permeability is determined