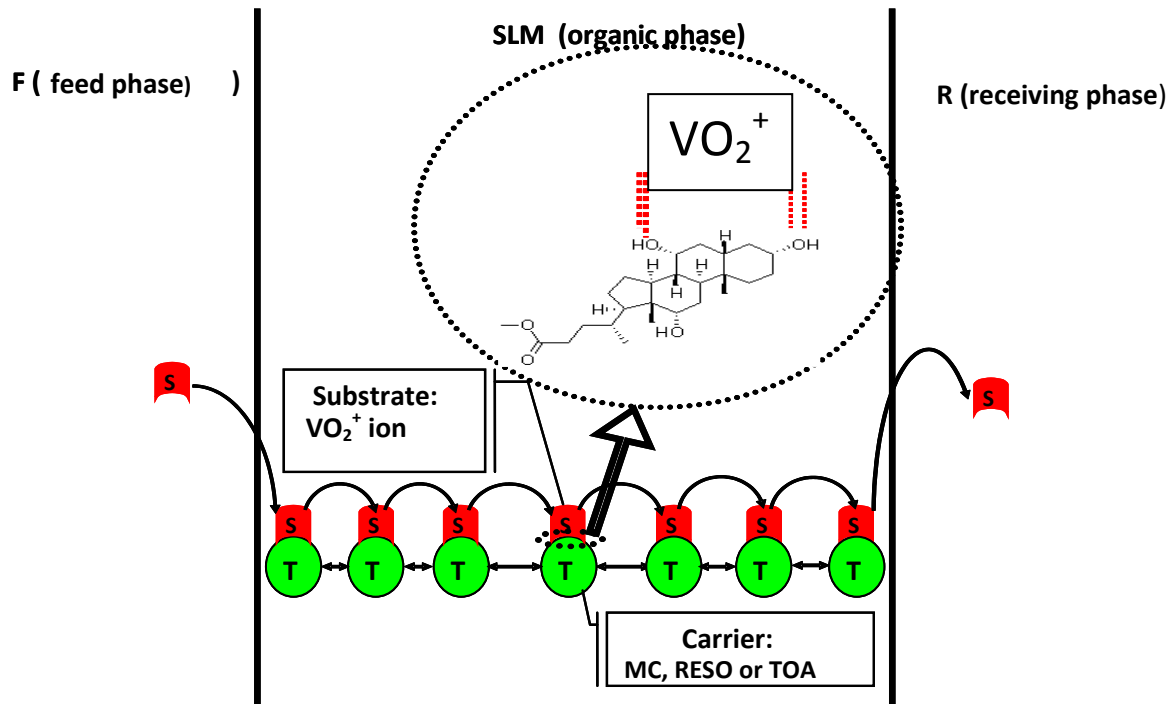


## Graphical Abstract



## Highlights

- Three effective extractive agents for facilitated extraction process of  $VO_2^+$  ions.
- Important values of macroscopic parameters  $P$  and  $J_0$  for this extraction phenomenon
- The evolution of  $K_{ass}$  and  $D^*$  parameters, to identify the movement nature of  $VO_2^+$  ions across the membrane
- Influence of the temperature factor, to confirm the mechanism by jumping of substrate on mobile sites.