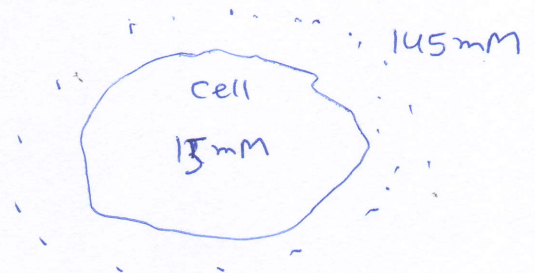


## Calculation of Nernst potential

Nernst potential is always measured with respect to potential outside cell

Let's calculate it for  $\text{Na}^+$  ions whose values are given as shown in diagram



$$V_2 - V_1 = \frac{k_B T}{ze} \ln \frac{C_1}{C_2}$$

Take  $V_1$  as  $V_{out}$ ,  $V_2$  as  $V_{in}$ ,  $C_1$  as  $C_{out}$  and  $C_2$  as  $C_{in}$

$$V_{out} - V_{in} = \frac{k_B T}{ze} \ln \frac{C_{out}}{C_{in}}$$

$$= \frac{4.14 \times 10^{-21}}{+1 \times 1.6 \times 10^{-19}} \ln \left( \frac{145}{15} \right)$$

$$= 5.870 \times 10^{-2} \text{ V}$$

$$= 58.70 \times 10^{-3} \text{ V}$$

$$= +58 \text{ mV}$$