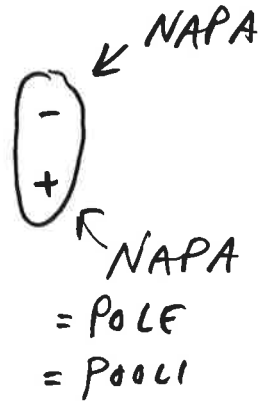
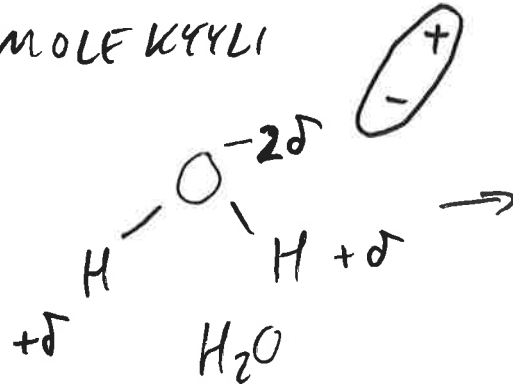


SÄHKÖ = ELECTRICITY
 = ELEKTRON
 = MERIPIHKA

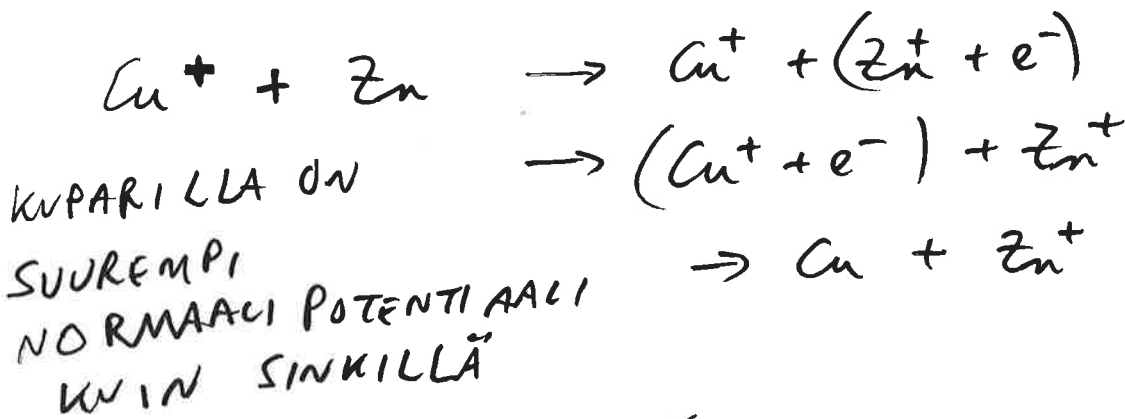
KEMIAA

DIPOLI MOLEKYYLI

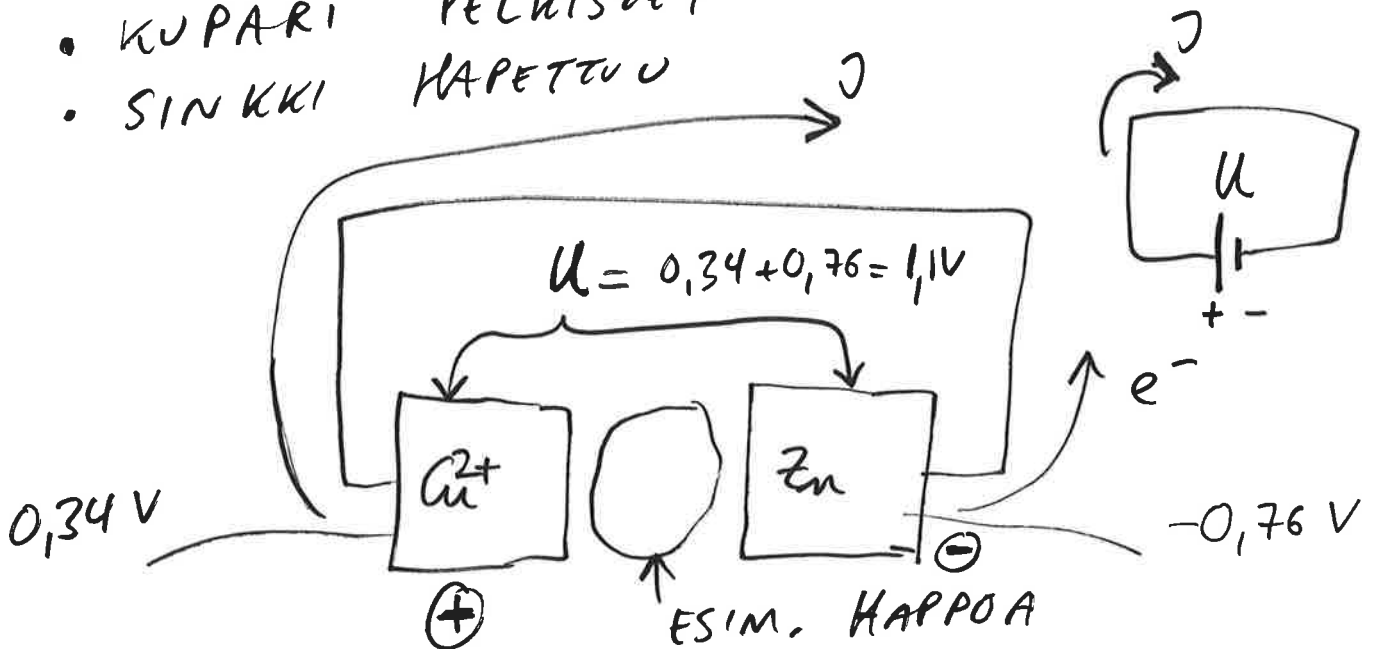
O on
 ELEKTRONEGATIIVI-
 SEMPI KUIN H



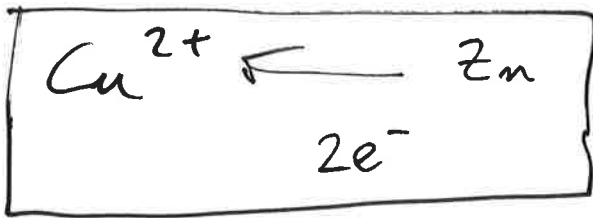
DIPOLI



- KUPARI PELKISTYY
- SINKKI HAPETUU



ESIM. 1 MOOLI Cu^{2+} JA
 1 MOOLI Zn



→ 2 MOOLIA
ELEKTRONEJA

$$n(\text{Cu}^{2+}) = 1 \text{ mol} \rightarrow 63,5 \text{ g}$$

$$n(\text{Zn}) = 1 \text{ mol} \rightarrow 65,4 \text{ g}$$

$$M(\text{Cu}^{2+}) = 63,5 \frac{\text{g}}{\text{mol}}$$

$$M(\text{Zn}) = 65,4 \frac{\text{g}}{\text{mol}}$$

SIIS MIKÄ ON PARISUON "KAPASITEETTI",
MONTAKO MAh?

2 MOOLIA ELEKTRONEJA

$$n(e^-) = 2 \text{ mol} = 2 \cdot \overbrace{6,022 \cdot 10^{23}}^{N_A} \text{ kpl}$$

$$Q(e^-) = 2 \cdot 6,022 \cdot 10^{23} \cdot 1,6022 \cdot 10^{-19} \text{ C}$$

$$= 2 \cdot 6 \cdot 1,6 \cdot 10^4 \text{ C}$$

$$= 2 \cdot 9,6 = \underline{\underline{19,2 \text{ C}}}$$

$1 \text{ A} = 1 \text{ C/s}$

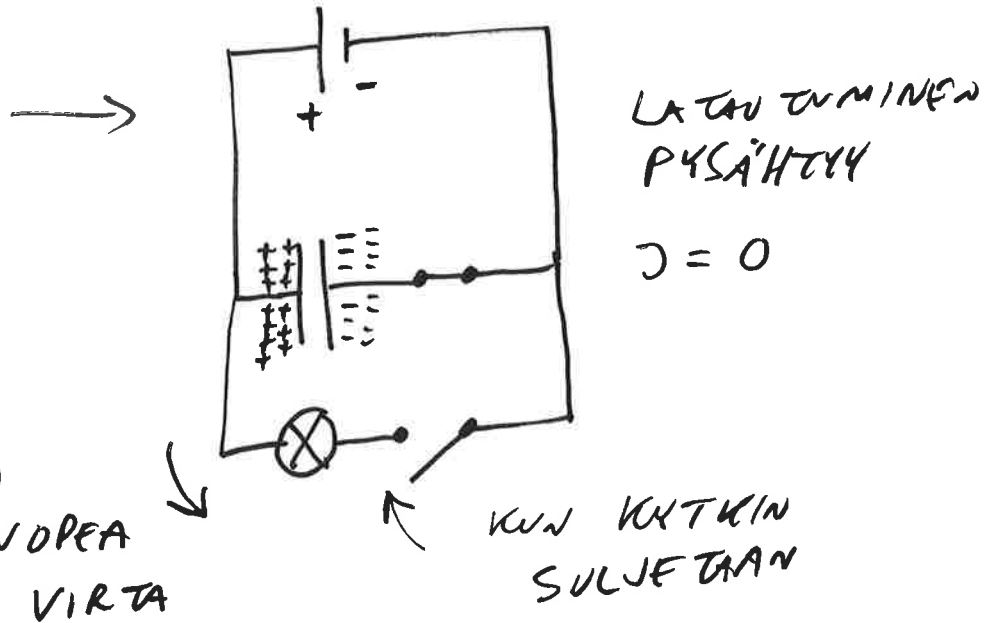
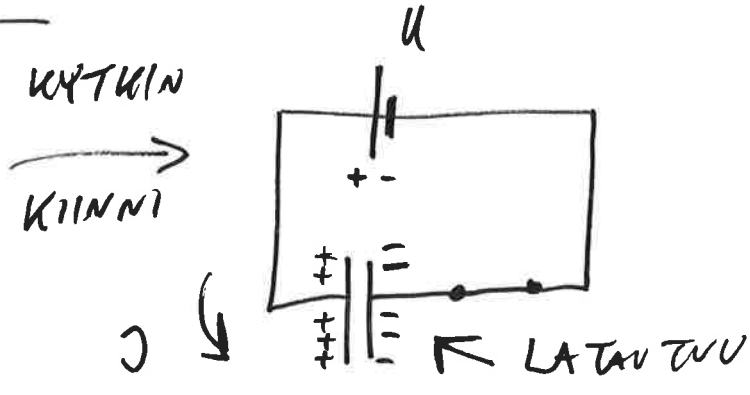
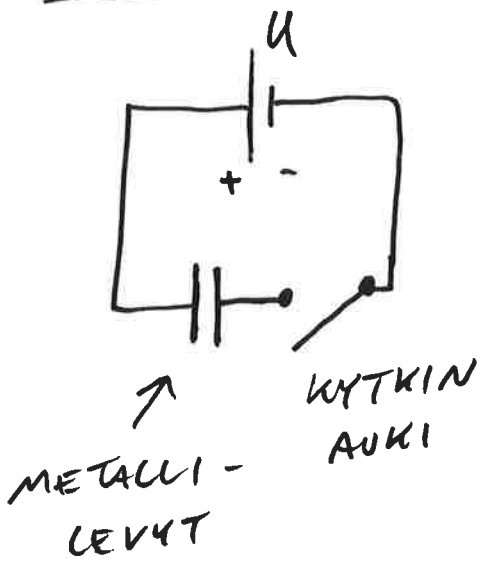
$$1 \text{ mAh} = 0,001 \cdot 1 \frac{\text{C}}{\text{s}} \cdot 3600 \text{ s}$$

$$= 3,6 \text{ C}$$

SIIS PARISUO: $\frac{19,2 \text{ C}}{3,6 \text{ C}} = 5,33 \text{ mAh}$

$$\frac{19,2 \text{ C}}{3,6 \text{ C}} \cdot 10^4 = \underline{\underline{53300 \text{ mAh}}}$$

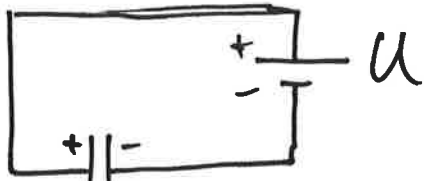
KONDENSAATTORI



KONDENSAATTORI = SÄHKÖVARASTO

⇒ SÄHKÖ KÄYTETTÄVISSÄ NOPEASTI

(VRT. PARISSA KEMIAALLINEN REAKTIO VÄTTÄÄ AIKAA)



$\left. \begin{array}{l} Q \\ -Q \end{array} \right\}$ SANOTAAN, ETTÄ
 KONDENSATORISSA ON
 VARAUS Q

JOS U TIEDETÄÄN, NIIN $Q = ?$
 $(Q \propto U)$

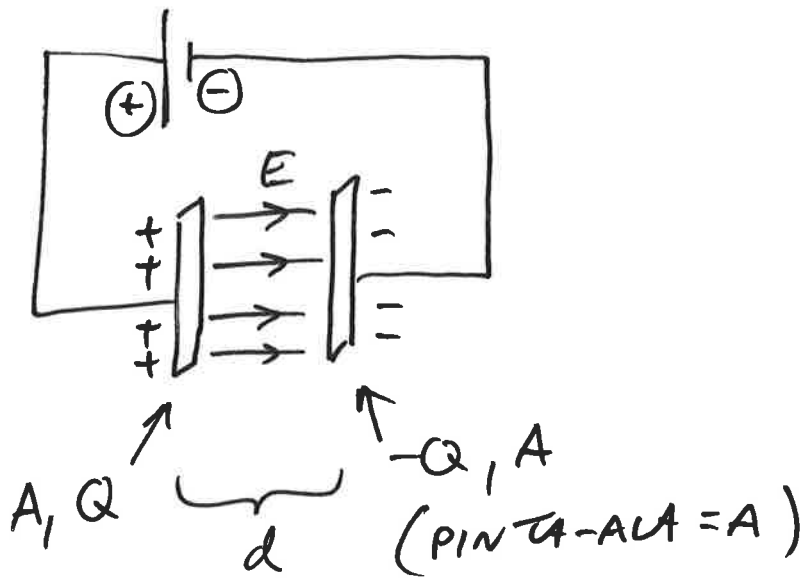
MÄÄRITELMÄÄN

$$C = \frac{Q}{U} \quad [C] = 1 \text{ F} = \text{FARAADI}$$

ESIM. JOS 1V JÄNNITE AIHEUTTA $Q = 2 \text{ C}$,
 NIIN $C = \frac{2 \text{ C}}{1 \text{ V}} = 2 \text{ F}$

$$\leadsto Q = CU$$

SIIS JOS $U = 5 \text{ V} \leadsto Q = 2 \text{ F} \cdot 5 \text{ V}$
 $= 10 \text{ C}$



$$E = \frac{\sigma}{\epsilon_r \epsilon_0} = \frac{Q}{A \epsilon_r \epsilon_0}$$

$$U = Ed$$

$$E = \frac{U}{d}$$

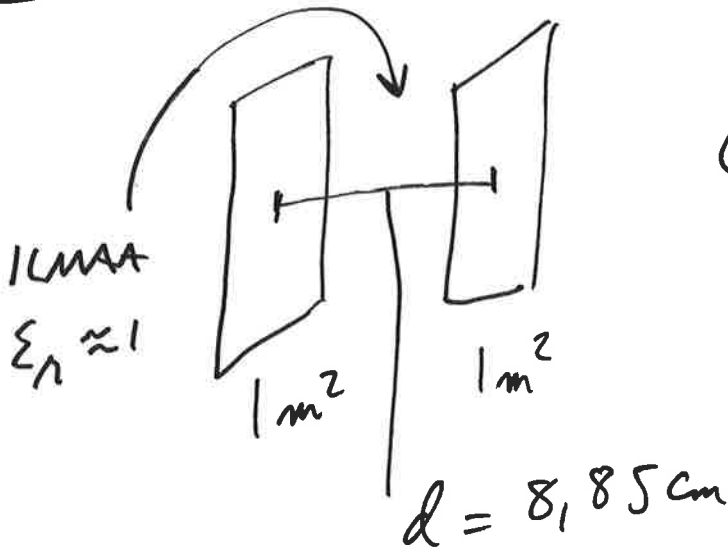
$$U = Ed = \frac{Qd}{A \epsilon_r \epsilon_0}$$

KAPASITANSI $C = \frac{Q}{U}$

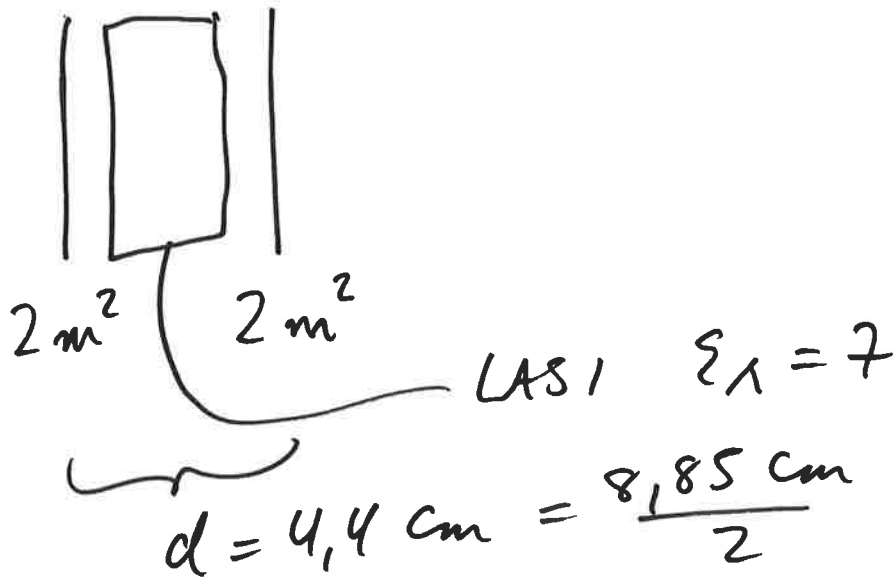
$$\hookrightarrow C = \epsilon_r \epsilon_0 \frac{A}{d} = \frac{Q}{\frac{Qd}{A \epsilon_r \epsilon_0}} = \epsilon_r \epsilon_0 \frac{A}{d}$$

ESIMc

nF



$$\begin{aligned} C &= \epsilon_r \epsilon_0 \frac{A}{d} \\ &= 1 \cdot \cancel{8,85} \cdot 10^{-12} \cdot \frac{1}{\cancel{8,85} \cdot 10^{-2}} \\ &= 10^{-10} \text{ F} \\ &= 0,1 \cdot 10^{-9} \text{ F} \\ &= \underline{\underline{0,1 \text{ nF}}} \end{aligned}$$



$$\begin{aligned} C &= 7 \cdot \cancel{8,85} \cdot 10^{-12} \cdot \frac{2}{\frac{\cancel{8,85}}{2} \cdot 0,01} \\ &= 7 \cdot 2 \cdot 2 \cdot 10^{-10} \text{ F} \\ &= \underline{\underline{2,8 \text{ nF}}} \end{aligned}$$