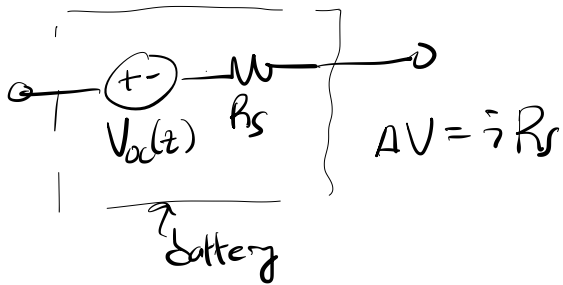
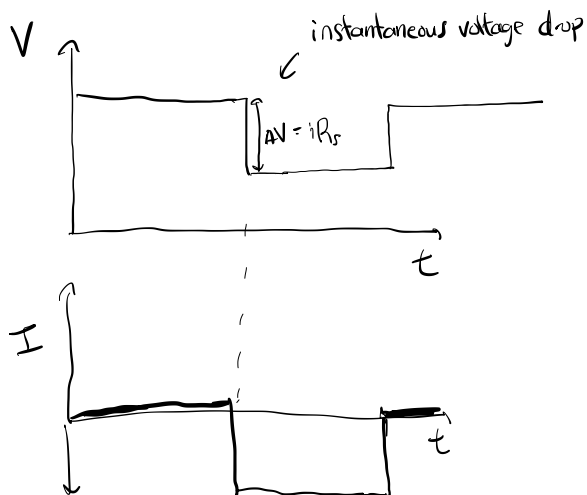


Where does battery resistance come from?

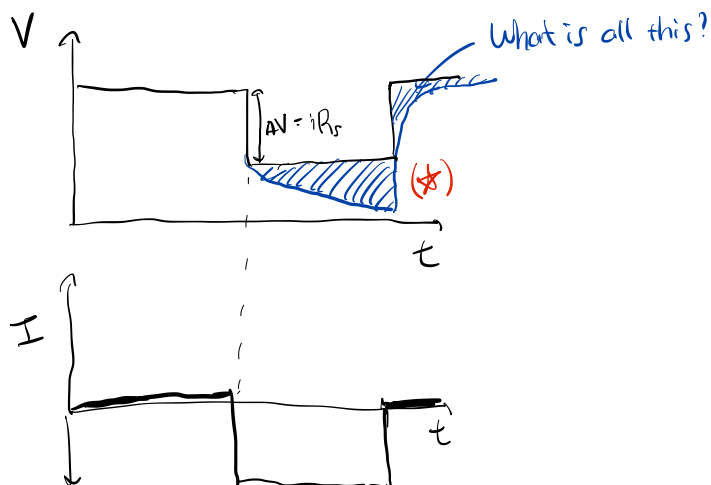
We started with this simplified OCV-R model of a battery:



Such a model would predict the following voltage response:

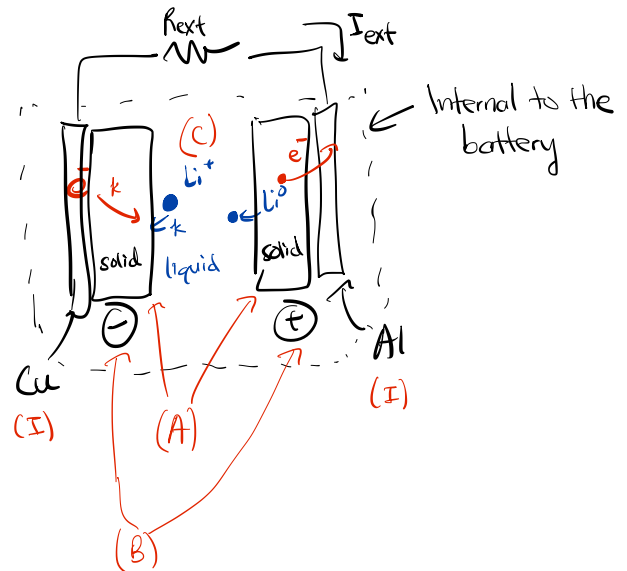


But in reality, the voltage response from a real cell looks like this:



Physical Sources of Resistance

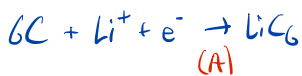
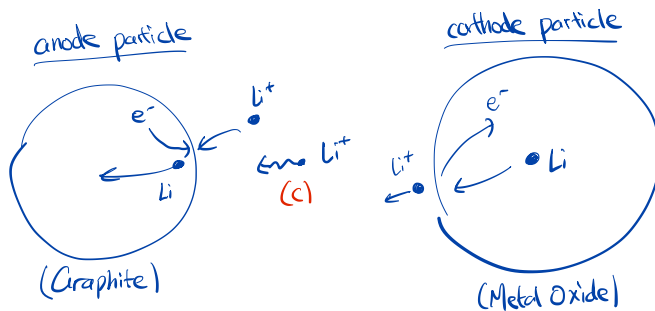
- inactive components (current collectors and tabs)
 - acts as electronic resistance (Ohmic) → (I)
- solid-liquid interface (A)
- active material (B)
- electrolyte (C)



There are at least 3 components to (*)

1. Charge transfer resistance (A) - surface phenomenon
2. Solid-phase diffusion (B) - bulk phenomenon
considerations: crystal structure
3. Liquid-phase diffusion (C)

e.g. during charge:



these reactions happen at the interface.
In order for this reaction to take place, Li needs to get to and from the interface:

↳ (B).