

Electrochemical Engineering CH692 In class work w3d1

(1) Consider that data below.

What is the experiment that is being performed most likely? How is it performed

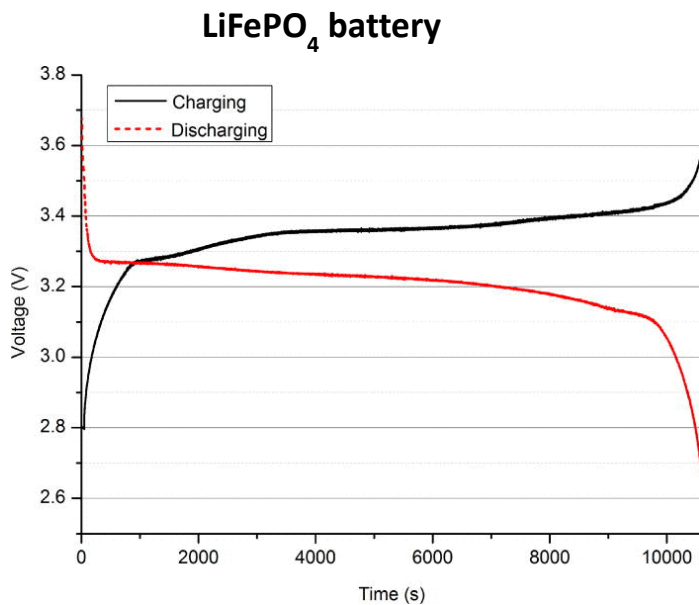
Why do the black and red curve cross? What determines the starting voltage of the black and red curves?

How can you calculate the coulombic efficiency from this data?

How could you calculate the voltage efficiency from this data?

How could you calculate the round-trip energy efficiency from this data?

For each, give a precise mathematical equation that illustrates what specifically in this data you use and how you manipulate it to make the calculation.



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(2) Consider the following mechanisms that lead to capacity fade:

- loss of active material
- larger polarization from increased charge transfer resistance or internal resistance
- chemical shorts (redox shuttling)
- increases in self-discharge rates

Design experiments and discuss how they will tell you the mechanisms that may be operative in the cell.