

## Answer on the question #68171, Chemistry / General Chemistry

### Question:

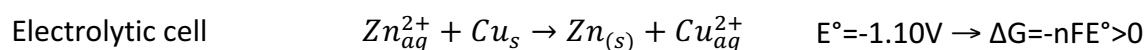
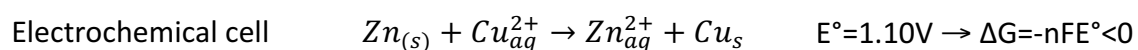
why are the half cell reactions in an electrolytic cell driven in the opposite direction to those in an electrochemical cell

### Answer:

The direction of the spontaneous reaction is determined by the change in Gibbs energy  $\Delta G$ . If  $\Delta G < 0$ , the reaction is spontaneous. If  $\Delta G > 0$ , we need to apply power or energy for this reaction to take place.

In electrochemical cell (galvanic cell) the reaction has a negative value of  $\Delta G$ . Thus, the potential energy difference is positive. In electrolyte cell the reaction is not spontaneous, so a power source is required. Indeed, to use electrolyte cell we always connect it to some kind of battery.

As the reaction in the galvanic and electrolytic cells can be the same, just the direction will be different :



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