Checking Where Plated Copper Came From

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

Two classroom plating models each add solid copper to a metal strip. Copper ions gain electrons at the strip. The other electrode may either supply copper ions by losing copper atoms or pass current through a different reaction that does not supply copper. The model keeps all copper in the strip, the second electrode, or the liquid.

Run	**Copper gained by the strip (mol)**	**Copper lost by the other electrode (mol)**
P	0.010	0.010
Q	0.010	0.000

1 Which change at the strip represents reduction?

(1) Cu^{2+} gains two electrons and becomes Cu.

(2) Cu loses two electrons and becomes Cu^{2+}.

(3) Cu^{2+} gains a proton and becomes Cu.

(4) Cu gains two electrons and becomes Cu^{2+}.

2 Predict the change in the dissolved copper amount in each run. Use the records for both electrodes. [1]

Answer and work

The strip begins a third run with fresh solution. It gains 0.010 mol of copper again. This time the dissolved copper amount falls by 0.004 mol.

3 Calculate the amount of copper supplied by the second electrode in the third run. [1]

Answer and work

$Cu^{2+} + 2\ e^{-} \rightarrow Cu$

4 A student says more electrons were used to reduce copper at the strip in P than in Q because the other electrode supplied copper in P. Evaluate the claim using the strip records and the reduction equation. [1]

Answer and work