Electrolysis

① Cathode: SOA gets reduced

Anode: SRA gets oxidized

②

	Voltaic	Electrolytic
Cathode	+	−
Anode	−	+

③ e^- move anode → cathode

anions (−) move toward anode

cations (+) move toward cathode

④ Reaction in electrolytic cell is not spontaneous. Application of a current (from power supply) forces reaction to occur.

⑤ a) $Cu(s)$, Cu^{2+}, SO_4^{2-}, $H_2O(l)$

SRA SOA

$Cu^{2+} + 2e^- \rightarrow Cu(s)$ $+0.34\ V$

$Cu(s) \rightarrow Cu^{2+} + 2e^-$ $-0.34\ V$

$Cu^{2+} + Cu(s) \rightarrow Cu(s) + Cu^{2+}$ $0\ V$

0 V required.

⑤ b) $Pt(s)$, Sn^{2+}, Br^-, $H_2O(l)$

SOA SRA

$Sn^{2+} + 2e^- \rightarrow Sn(s)$ $-0.14\ V$

$2Br^- \rightarrow Br_2(g) + 2e^-$ $-0.16\ V$

$Sn^{2+} + 2Br^- \rightarrow Sn(s) + Br_2(g)$ $-1.2\ V$

1.2 V required.

⑥ a) $Ag(s)$, Fe^{3+}, Cl^-, H_2O

SRA SOA

Not spontaneous, since Fe^{3+} + $Ag(s)$

b) $Cu(s)$, Pb^{2+}, NO_3^-, H_2O

SRA SOA

Spontaneous, since $Cu(s)$ + NO_3^-