

Chemical Reactions

Classifying chemical reactions *(in high school chemistry)*

synthesis



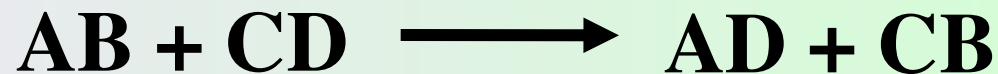
decomposition



single replacement



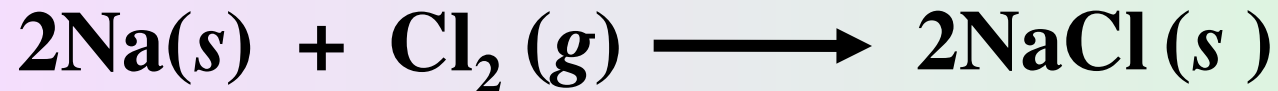
double replacement



synthesis

two or more substances combine to produce a single (more complex) substance

(oxidation reduction reactions)



element

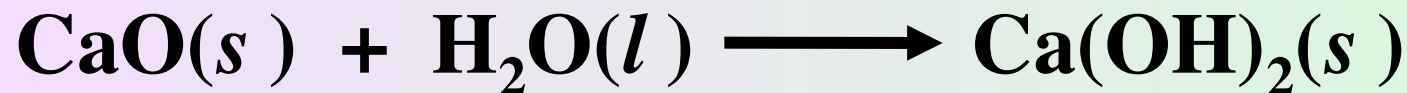
element

compound

synthesis

two or more substances combine to produce a single (more complex) substance

(oxidation reduction reactions)



compound

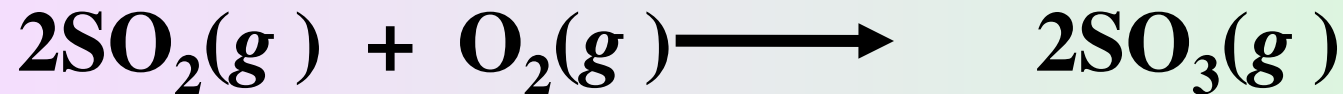
compound

compound

synthesis

two or more substances combine to produce a single (more complex) substance

(oxidation reduction reactions)



compound

element

compound

decomposition

a single substance is broken down into two or more simpler substances

(oxidation reduction reactions)



compound

element

element

decomposition

a single substance is broken down into two or more simpler substances

(oxidation reduction reactions)

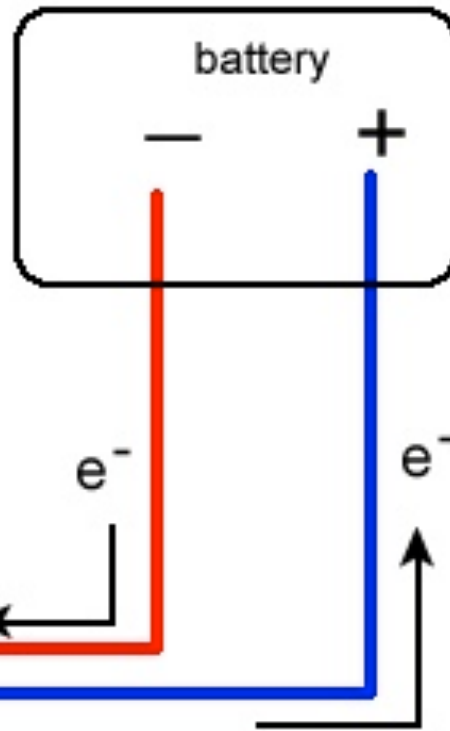
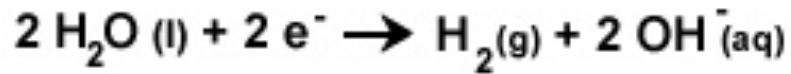
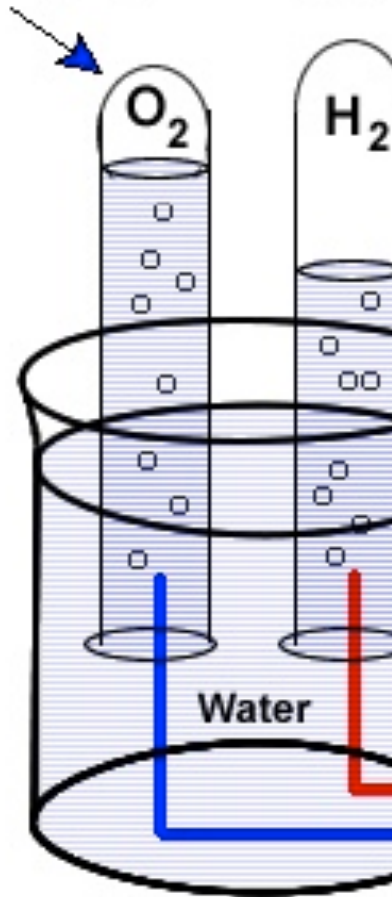
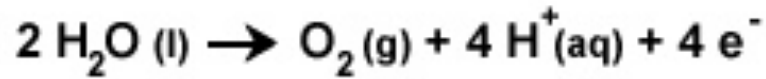


compound

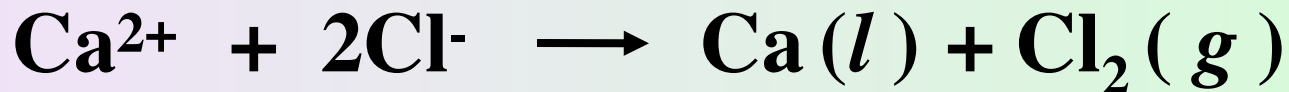
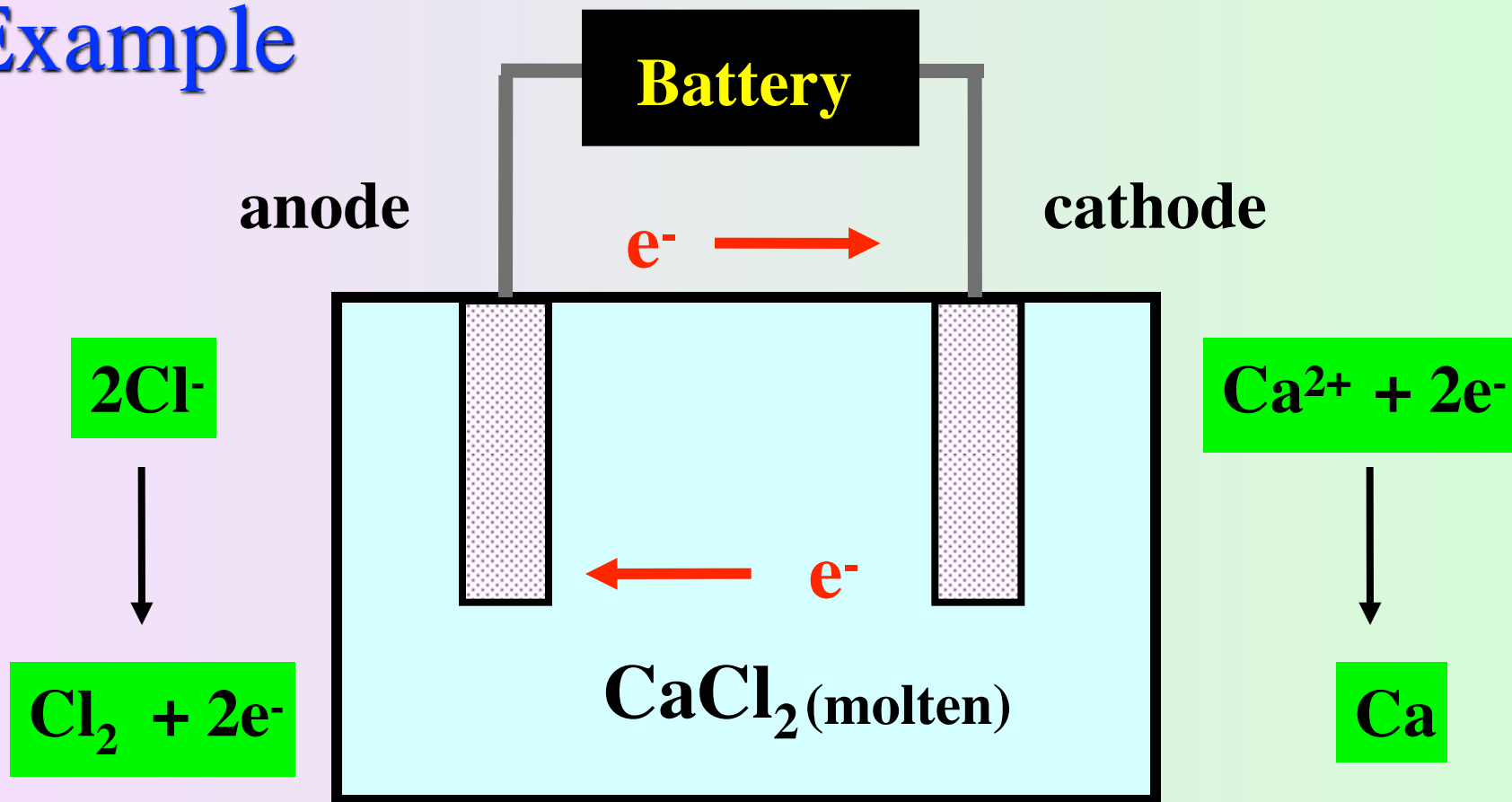
compound

compound

decomposition



Example



single replacement reactions

a free element becomes an ion, and an ion in solution becomes a neutral atom

(oxidation reduction reactions)



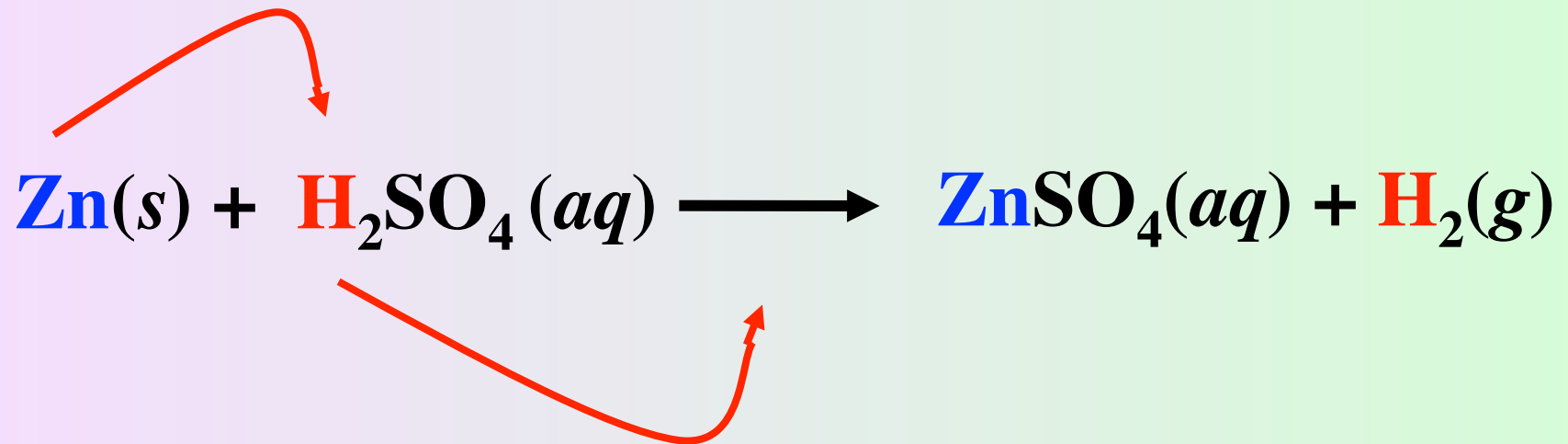
single replacement reactions

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(oxidation reduction reactions)



single replacement reactions



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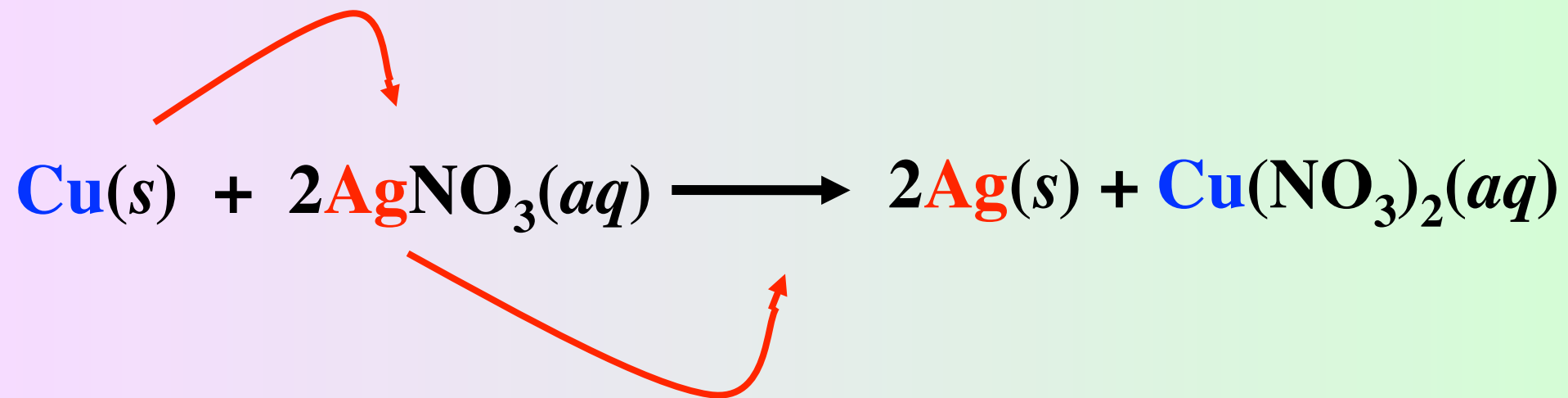
single replacement reactions

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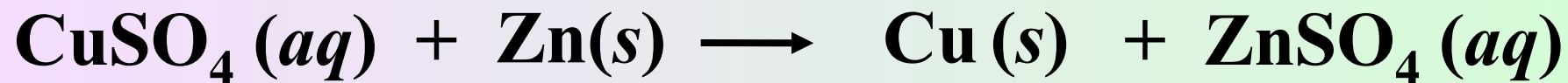
(oxidation reduction reactions)

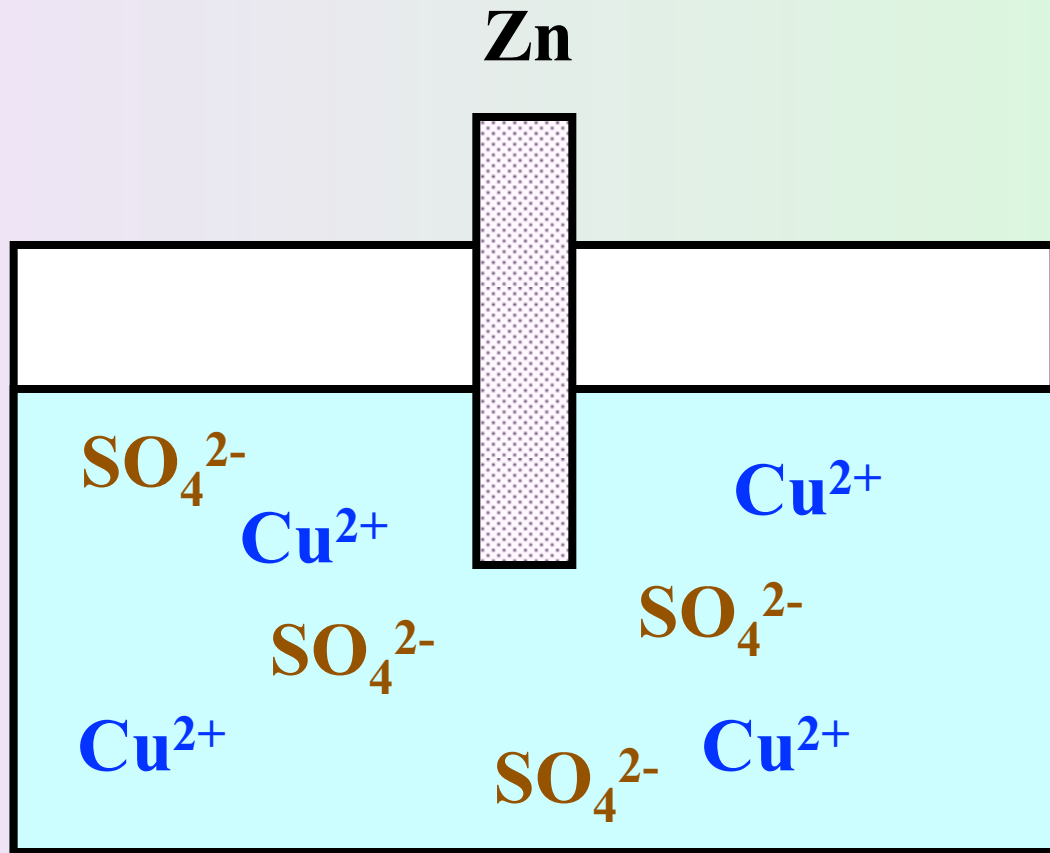


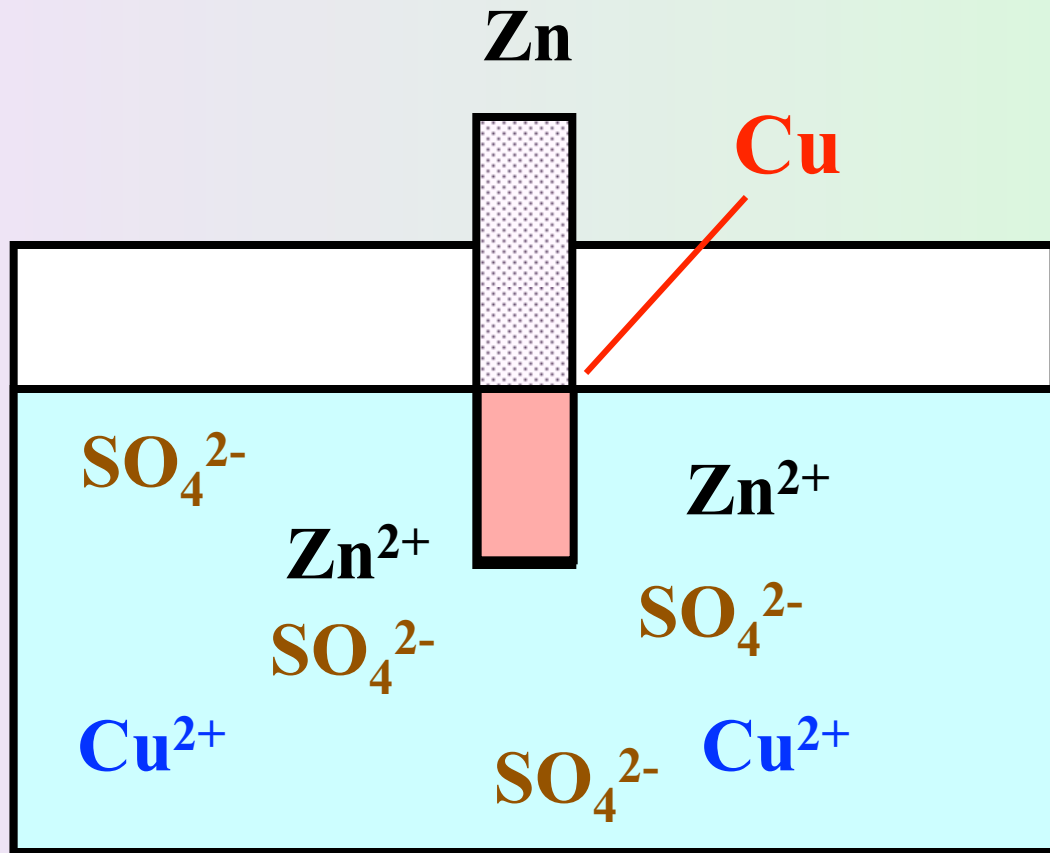
single replacement reactions



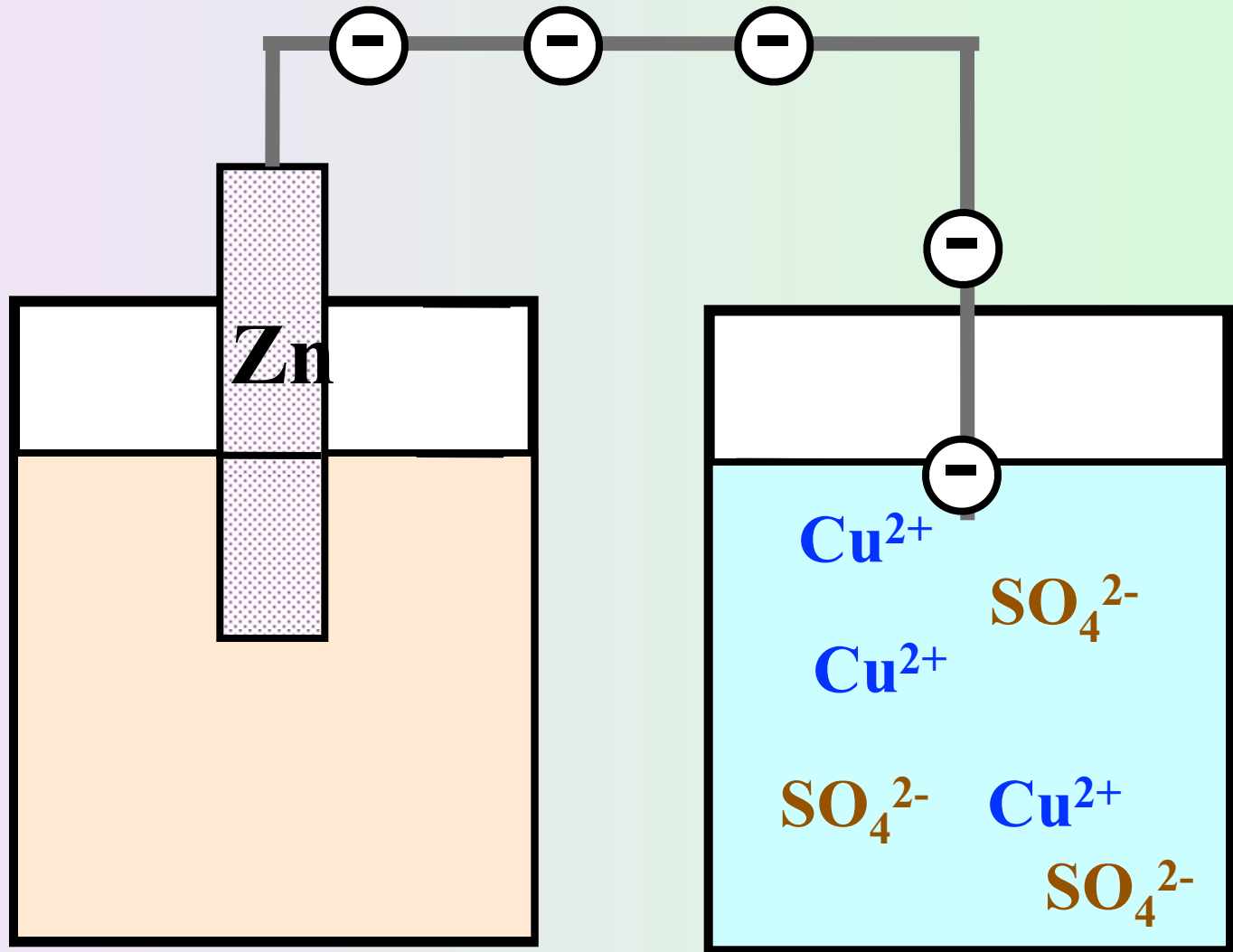
single replacement reactions



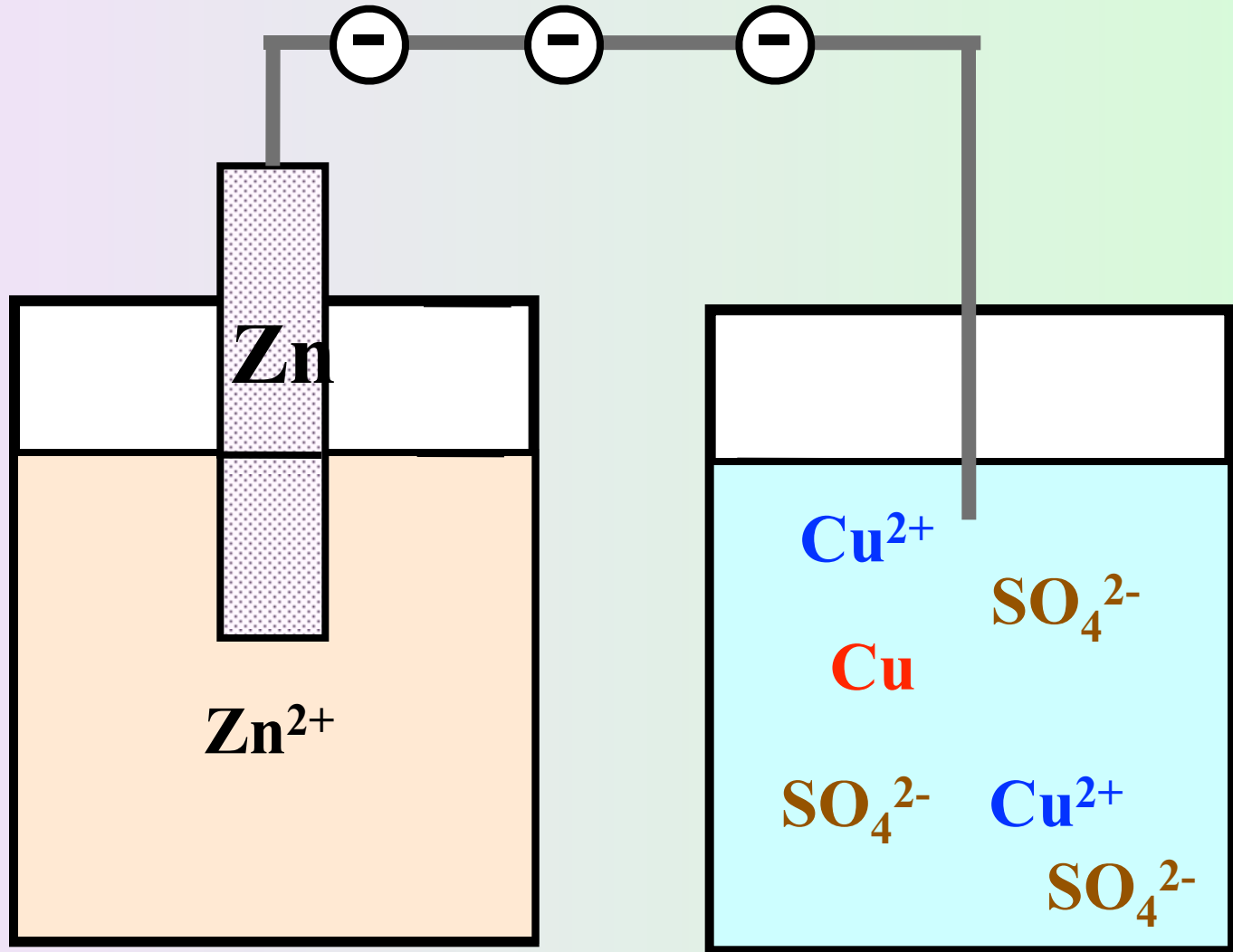




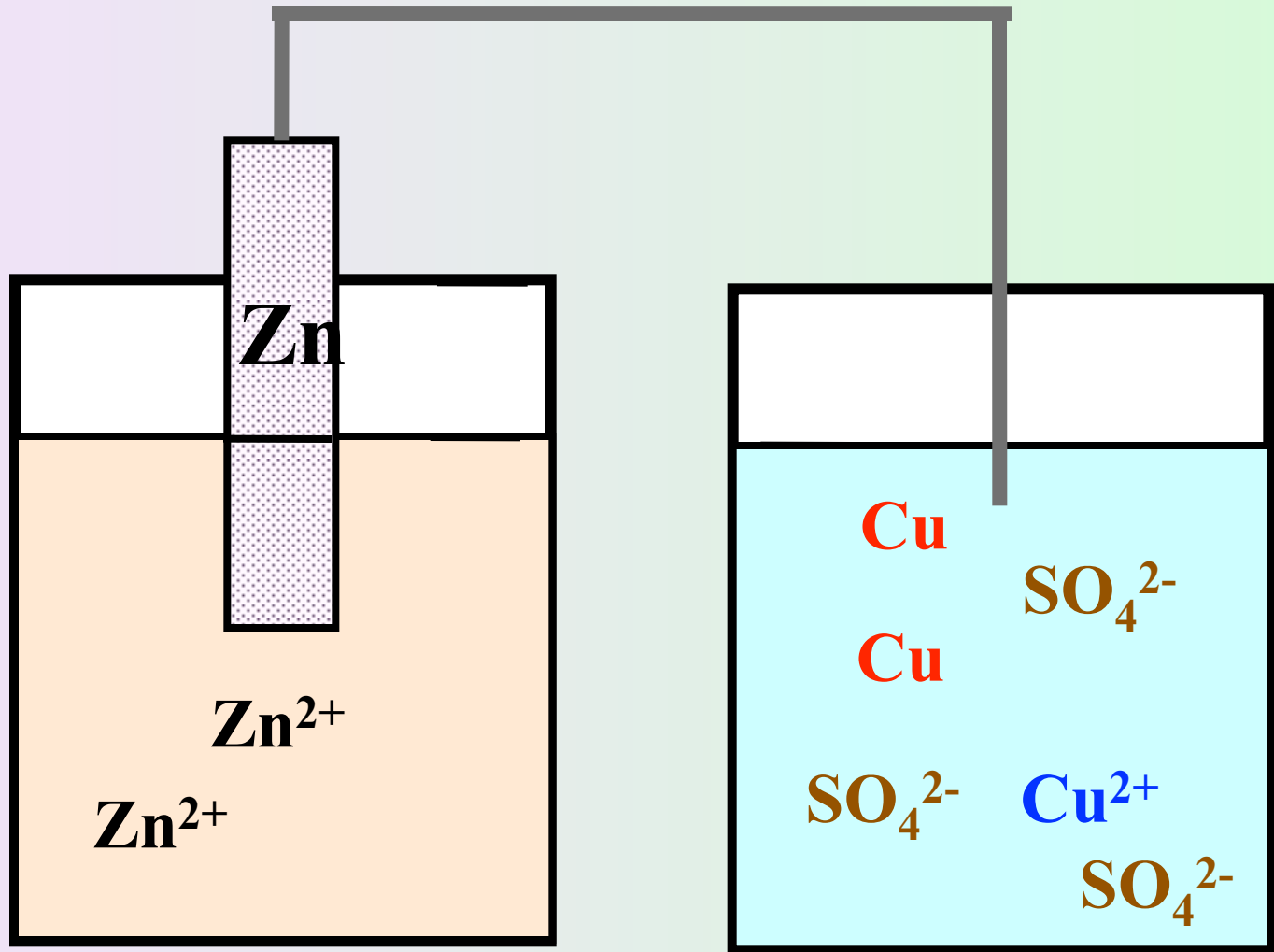
Consider the same two species in separate vessels



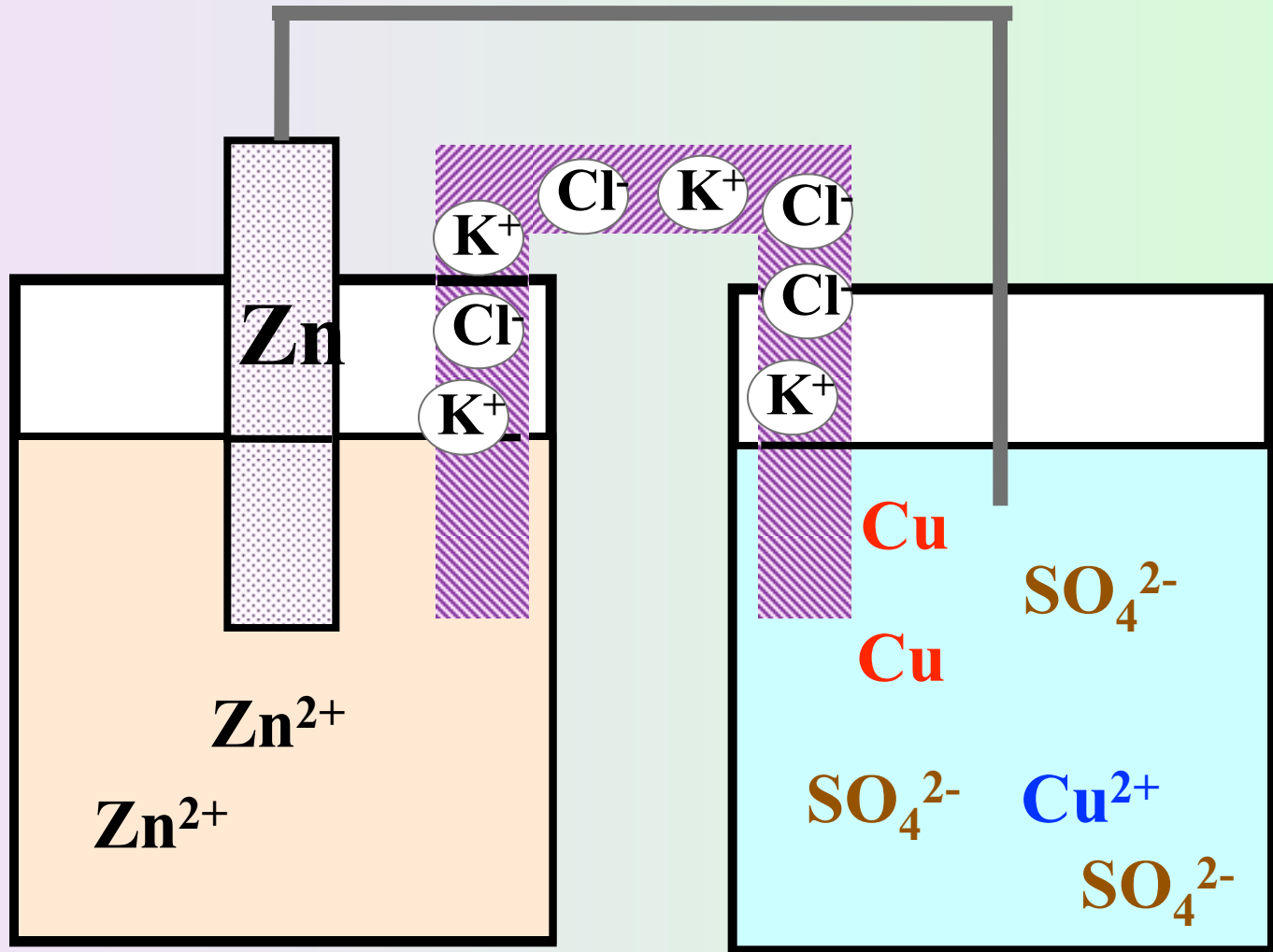
Consider the same two species in separate vessels



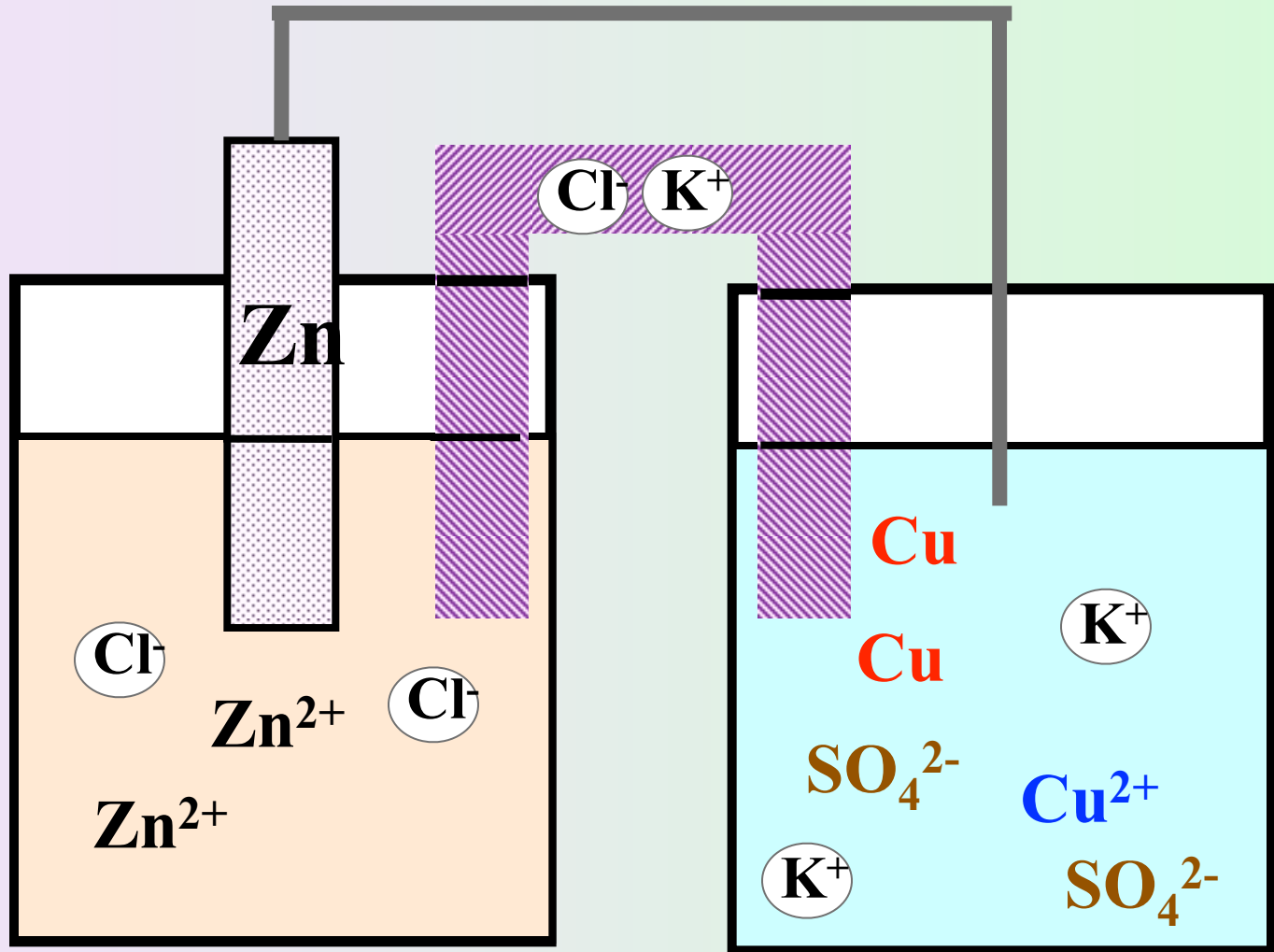
Consider the same two species in separate vessels
electrons soon stop flowing



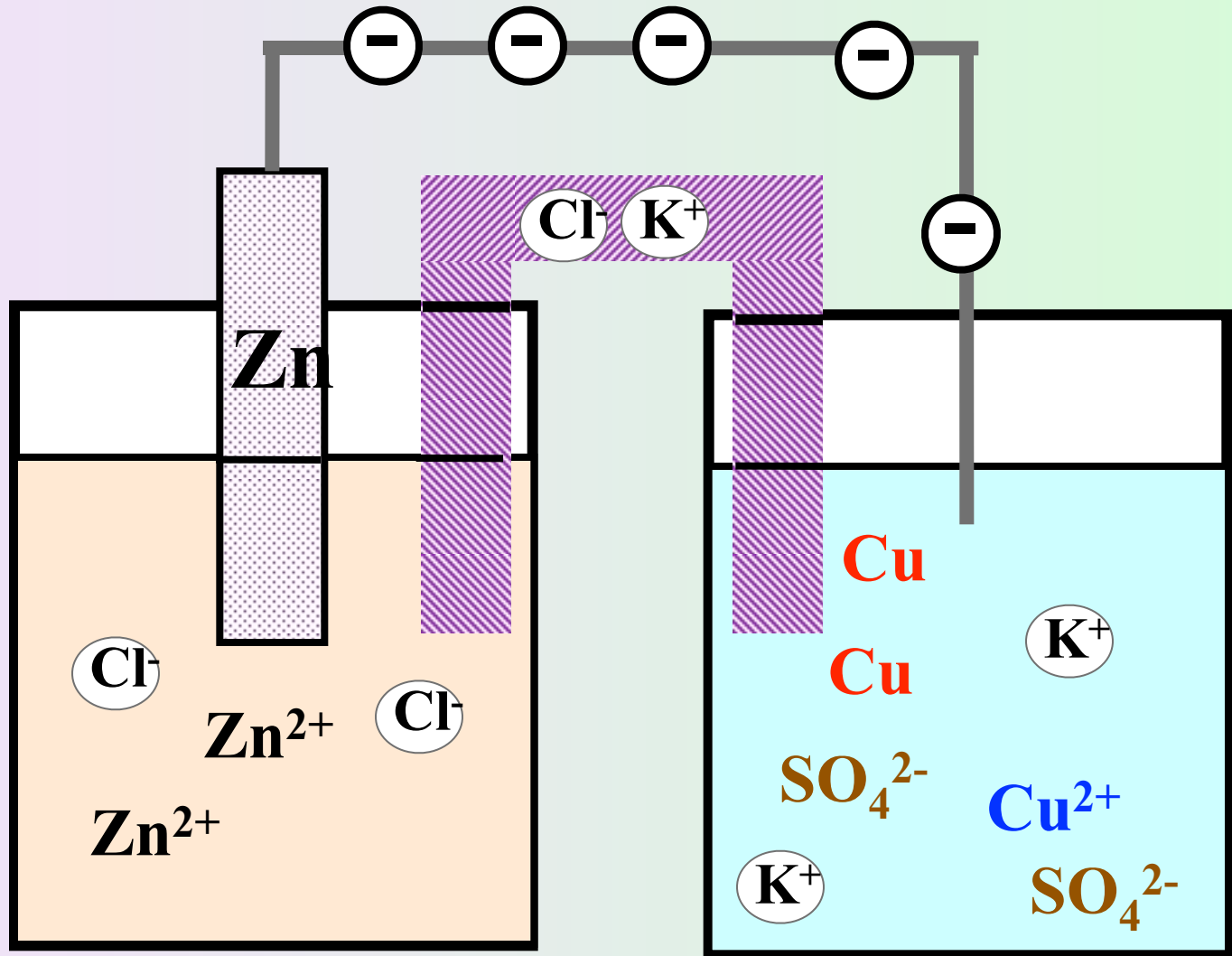
a salt bridge



Ion flow balances charges



Ion flow balances charges and permits electron flow



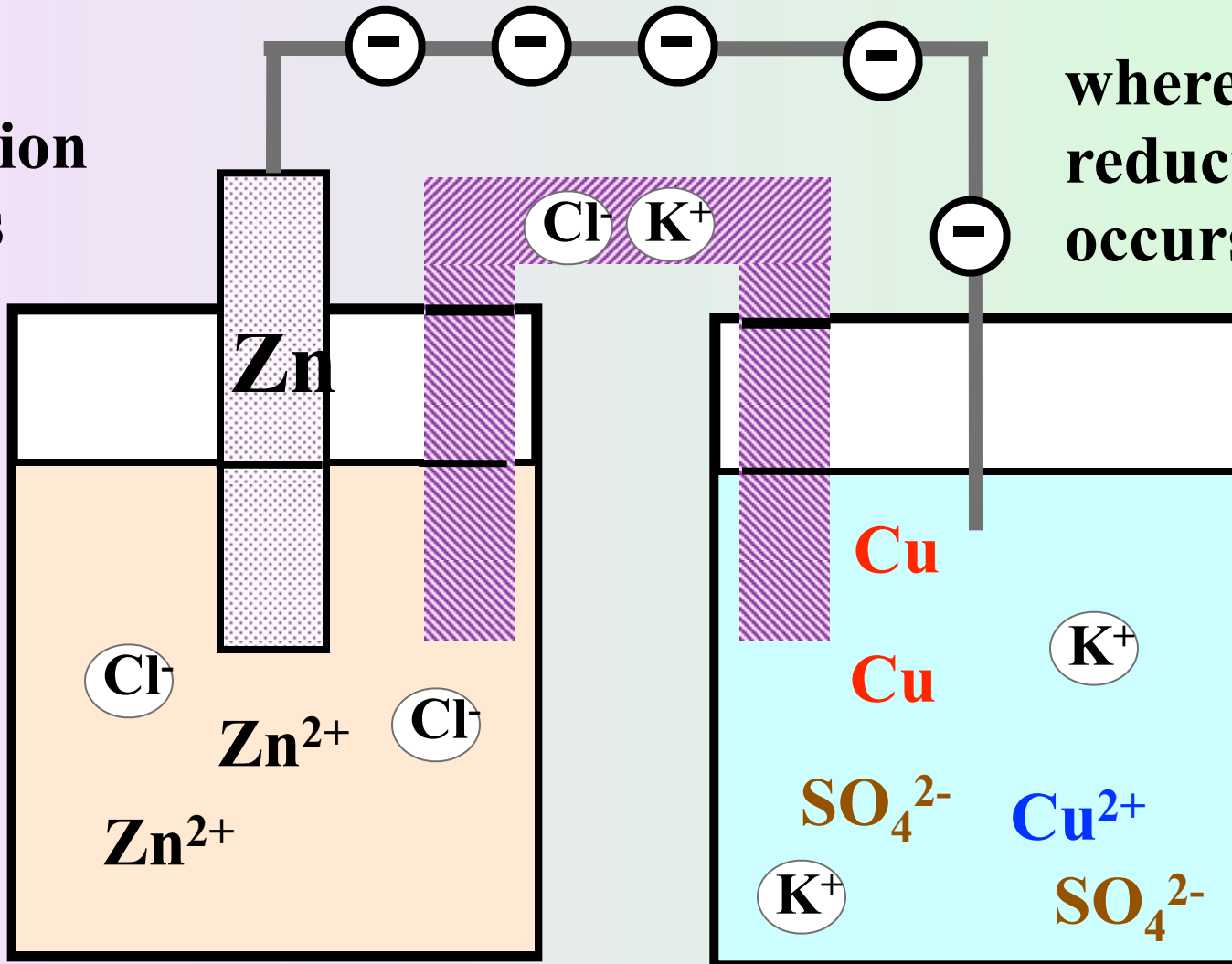
Galvanic cell

Anode

Cathode

where
oxidation
occurs

where
reduction
occurs



double replacement reactions

the cation of one aqueous compound replaces the cation in another aqueous compound

(precipitation reactions)



double replacement reactions

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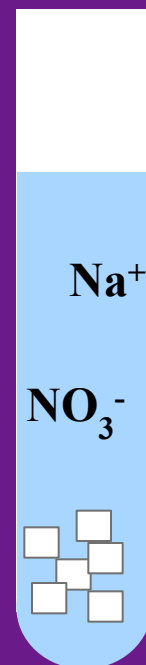
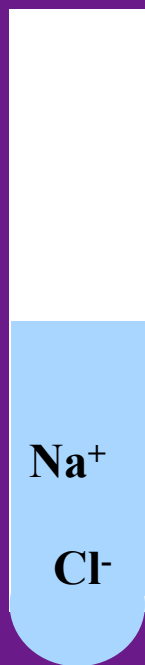


double replacement reactions





+



$\text{AgCl}(\text{s})$

combustion reactions

oxygen combines with a substance releasing energy.

(oxidation reduction reactions)



combustion reactions

oxygen combines with a substance releasing energy.

(oxidation reduction reactions)



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