# Answer on Question #69255, Chemistry, General Chemistry

Will a reaction occur spontaneously when the chemicals are put in contact with each other? If yes, balance.

Al and $Ca^{+2}$

$Fe^{+3}$ and Zn

HCl and Ag

$H_2SO_4$ and K

$Na^{+1}$ and $Fe^{+2}$

**Solution:**

1) Al and $Ca^{+2}$. This reaction is impossible because Ca is more active than Al, according to the Metal Activity Series and its standard electrode potentials. That's why Al cannot replace $Ca^{+2}$ from its salt.
2) $Fe^{+3}$ and Zn. This reaction is possible because Zn is more active than Fe, according to the Metal Activity Series and its standard electrode potentials. That's why Zn can replace $Fe^{+3}$ from its salt:

   $2Fe^{+3} + Zn \rightarrow 3Zn^{+2} + Fe$
3) HCl and Ag. This reaction is impossible because Ag is situated after H, according to the Metal Activity Series. That's why Ag cannot replace $H^+$ from this acid.
4) $H_2SO_4$ and K. This reaction is possible because K is situated before H, according to the Metal Activity Series. That's why K can replace $H^+$ from this acid:

   $2K + H_2SO_4 \rightarrow K_2SO_4 + H_2\uparrow$
5) $Na^{+1}$ and $Fe^{+2}$. For example, if we have reaction between sodium hydroxide NaOH and iron (II) chloride, it means between base and salt, so this reaction is possible:

   $NaOH + FeCl_2 \rightarrow Fe(OH)Cl + NaCl$

   Or:

   $2NaOH + FeCl_2 \rightarrow Fe(OH)_2\downarrow + 2NaCl$

   Or if we have reaction between two different salts such as:

   $2NaCl + FeSO_4 \rightarrow FeCl_2 + Na_2SO_4$

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