

N₂ fixation
$$N_2 + 8e^- + 8H^+ = 2NH_4^+$$
Nitrification $NH_4^+ + 2O_2^- = NO_2^- + 2H^+ + H_2O$ $NO_2^- + 0.5O_2^- = NO_3^-$
Denitrification $NO_3^- + 5e^- + 6H^+ = 1/2N_2 + 3H_2O$