



- Diffusion
- N₂ fixation $\text{N}_2 + 6\text{e}^- + 8\text{H}^+ = 2\text{NH}_4^+$
- Nitrification $\text{NH}_4^+ + 2\text{O}_2^- = \text{NO}_2^- + 2\text{H}^+ + \text{H}_2\text{O}$ $\text{NO}_2^- + 0.5\text{O}_2^- = \text{NO}_3^-$
- Assimilatory NO₃⁻ reduction or NH₄⁺ assimilation
- DNRA $\text{NO}_3^- + 8\text{e}^- + 10\text{H}^+ = \text{NH}_4^+ + 3\text{H}_2\text{O}$
- Denitrification $1.5\text{CH}_3\text{COOH} + 2\text{NO}_3^- = 3\text{CO}_2 + 3\text{H}_2\text{O} + \text{N}_2$
- Anaerobic ammonia oxidation $\text{NO}_2^- + \text{NH}_4^+ = \text{N}_2 + 2\text{H}_2\text{O}$