

Nitrogen Cycle:

The sequence of biochemical changes undergone by nitrogen where it's use by living organisms, liberated upon the death and decomposition of organism and converted to original state.

The process involved in Nitrogen cycle.

(I)-Mineralization:

The conversion of an element from its organic form to inorganic form as a result of microbial activity.

Proteins \longrightarrow Amino acid \longrightarrow NH_4NO_3

(II)-Mineralization:

Proteins \longrightarrow Amino acid and amide. It is conversion of proteins into amino acid and amide by the heterotrophic microbes.

(III)-Amonification:

The conversion of amino acid and other nitrogen containing compounds into ammonium N_4H is called amonification.

(IV)-Fetch of NH_4 :

The released ammonia can be taken up by plants and micro organism can be held on exchange complex and can be fetched by 2-1 type clay minerals.

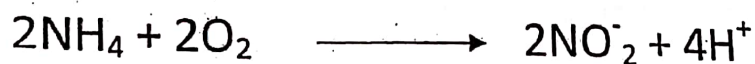
(V)-Nitrification:

It is biological oxidation of N_4H (ammonium) to nitrites (N_2O) and then to nitrates (N_3O)



It is done by autotrophs soil bacteria under aerobic conditions.

Chemical Reaction:



(VI)-Immobilization:

Conversion of an element from its in-organic to organic form in microbial or plant tissue is known as immobilization.

(VII)-Biological N-fixation:

It is process by which micro-organism convert gaseous nitrogen to a compound which they or higher plants can utilized in their growth processes.

Types:

(I)-Symbiotic N-fixation:

For symbiotic N-fixation 2 partners are needed

- I) Plants II) Microbes

The site of fixation is a nodule formed on the root or on the stem. In legume plants nodules are formed on roots by rhizobium bacteria. In symbiotic N-fixation micro-organism converts nitrogen to NH_4 ($\text{N}_2 \rightarrow \text{NH}_4$).

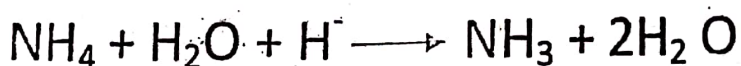
(II)-Associative N-fixation:

When micro-Organism live in association with plants without forming nodules is called associative symbioses or associative N-fixation.

3 ways by which N losses.

i)-Volatilization of NH_3 :

If fertilizer containing NH_3 placed on surface of alkaline soils, free NH_3 can be lost especially when temperature is raised.



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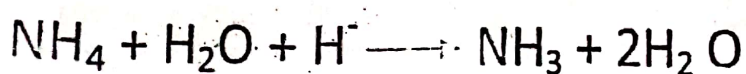
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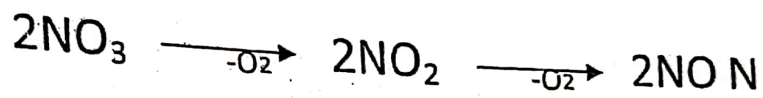
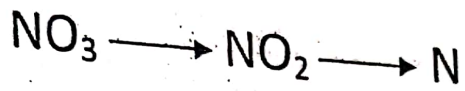
i)-Volatilization of NH_3 :

If fertilizer containing NH_3 placed on surface of fine soils, free NH_3 can be lost especially when temperature is raised.



ii)-Denitrification of NH_3 :

This is biological reduction of nitrates (NO_3) into nitrites (NO_2) and to molecular nitrogen (N_2) or nitrous oxide by micro-biological activities under an aerobic condition.



iii)-Leaching Losses:

Removal of nitrogen especially nitrates in solution form by downward movement of H_2O to the soil is known as leaching losses of N_2 .