

# Fundamental methods to eliminate organic nitrogen from sewage water: A comprehensive analysis

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## ABSTRACT

Adulteration of hydrosphere is a rapidly expanding natural challenge. Certain noxious environmental and illness are associated with nitrogen pollution in various water sources, especially in younger age groups. As a result, most of the nations have imposed rigid norms over the concentration of azote compounds in sewage water. Sewage water processing involves energy-intensive and expensive organic processes that transforms azote compounds into innocuous azote gas. However, on the contrary, Nitrogen is a key constituent of amino acids, which are, as well considered as the fundamentals of proteins, and nucleic acids, those are the basic unit of genetic material (RNA and DNA). Synthetic composts are generated by fixing aerial nitrogen gas in an energy consuming organic process. Preferably, the usage of chemicals and energy should be at minimal level in order to eliminate the nitrogen from sewage water. Also, it should be able to restore some composts and manures. This review gives an outline about different organic nitrogen elimination methods that involves oxidation of ammonium compounds, reduction of nitrates and nitrites, and anammox reaction, also, bio electrochemical systems for nitrogen extraction and growth of microphytes.

## 1. Introduction

Groundwater and other water bodies are adulterated with azote compounds. As fertilizer use in agriculture

increases, it has been reported in Canada that about 293,000 tonnes of nitrogen per year contaminate surface and groundwater. In addition, when various types of waste such as industrial waste, animal waste, and domestic waste flow into untreated water bodies, it causes water pollution. Municipal wastewater treatment facilities (WWTPs) also generate about 80,000 tonnes of nitrogen pollution per year to surface and groundwater [1]. Many countries have strict nitrogen emission standards. For example, in the United States, wastewater treatment plants should emit below 5 mg/L of ammonium and 15 mg/L of entire nitrogen. Therefore, nitrogen removal from wastewater

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