

ABSTRACT

Method for the biological purification of ammonium-containing wastewater

The invention relates to a method for the biological purification of ammonium-containing wastewater, in particular cold wastewater between 7 and 25°C, in an aeration tank (3) in which the ammonium (NH_4) contained in the wastewater is reacted at a predetermined oxygen concentration to form elemental nitrogen (N_2). The surplus sludge formed in the reaction is fed at least in part to a sludge digestion, during which the organic constituents of the sludge are converted to gas. The sludge is then fed to a sludge dewatering and the high-nitrogen, warm sludge water that is separated off from the sludge and which has, in particular, a nitrogen concentration from 500 to 2000 mg/l and a temperature of about 25 to 39°C is then fed to a deammonifying tank (18). The nitrogen compounds (NH_4 , organic nitrogen) contained in the sludge water are converted by deammonification to elemental nitrogen (N_2) in the deammonifying tank (18). According to the invention it is provided that a surplus sludge formed in the deammonification of the sludge water is fed to the aeration tank (3) and a low oxygen concentration of less than 1.0 mg/l is set in the aeration tank (3) in such a manner that the ammonium (NH_4) present in the wastewater is first converted using aerobically oxidizing bacteria (AOB) to nitrite (NO_2) and then, using anaerobically oxidizing bacteria (ANAMMOX), in particular Planctomycetes, ammonium (NH_4) and nitrite (NO_2) are converted to elemental nitrogen (N_2), wherein the surplus sludge formed in this deammonification in the aeration tank (3), before the feed to the sludge digestion, is separated into a heavy sludge phase which contains mainly the anaerobically ammonium (NH_4)-oxidizing bacteria (ANAMMOX), and a light sludge phase, wherein the heavy sludge phase is returned to the aeration tank (3) and the light sludge phase is fed as surplus sludge to the sludge digestion.

(one figure)