METHOD AND APPARATUS FOR NITROGEN REMOVAL IN WASTEWATER TREATMENT

ABSTRACT

One or more reactor and one or more control methods are used for nitrogen removal in wastewater treatment to achieve measured control of maintaining high ammonia oxidizing bacteria (AOB) oxidation rates while achieving nitrite oxidizing bacteria (NOB) outselection, using various control strategies, including: I) ammonia and the use of ammonia setpoints; 2) operational DO and the use of DO setpoints; 3) bioaugmentation of anammox and lighter flocculant AOB fraction; and 4) implementation of transient anoxia in several reactor configurations and conditions for removal of oxidized nitrogen using anammox or heterotrophic organisms. Controls described maximize nitrogen removal with minimal aeration, through control of transient anoxia and aerobic SRT, out-selection of NOB, and control of DO concentrations or aeration interval by keeping the reactor ammonia (NH4) and oxi<lized nitrogen (NOx) concentrations approximately equal.

Fig. 8