



Fig. 1. This figure is re-drawn and updated from Codispoti et al. (2005). The suite of reactions supporting canonical denitrification are shown by the red (nitrification) and dark blue (canonical denitrification) arrows. The green arrows indicate a denitrification process that is associated with nitrification. This process produces N_2O and might also produce N_2 . During these three processes, the intermediates, N_2O , NO , and NO_2^- can leave the cell and be changed between nitrifiers and denitrifiers. The NO_2^- produced can also support the anammox pathway (yellow arrows) in which NH_4^+ is oxidized to N_2 and NO_2^- is reduced to N_2 . A review of the literature also suggests that oxidation of organic-N or NH_4^+ by NO_3^- , iodate (IO_3^-), oxidized metals such as Mn (III&IV), Fe (III) and various oxidized trace metals can also produce N_2 (light blue arrow). Not shown is the possibility that the oxidation of Mn (II) by NO_3^- may also produce N_2 (Luther et al., 1997). Intermediate chemicals involved in the anammox reaction (e.g. hydrazine) are omitted for simplicity.