

عنوان مقاله:

Effect of Metal Nanoparticles on Biological Denitrification Process: A Review

محل انتشار:

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خلاصه مقاله:

Globally, increasing nitrate concentrations have become a serious environmental problem and a potential risk to public health. The World Health Organization (WHO) has set a limit of (10 mg/ (L)) NO3- for human consumption and (100 mg/ (L)) NO3- for animals. Water above these limits requires denitrification. Nitrate causes cancer, blue-baby syndrome, hypertension and thyroid hypertrophy. Several treatment processes can remove nitrates from water with varying degrees of efficiency, cost, and ease of operation. Among these processes chemical denitrification and biological denitrification are useful processes considering efficiency cost and maintenance. Denitrifying microorganisms are able to reduce nitrate to innocuous nitrogen gas using suitable source of electron. Oxides of metal nanoparticles, hydrogen gas, and sulfur reduced compounds; pyrite and arsenate have been used as electron donors for biological nitrate reduction. Among these electron donors H2 and oxides of metal nanoparticles have better performance in the removal of nitrate. Bio-denitrification coupled to metal nanoparticle oxidation is an inexpensive and advantageous process for nitrate removal from source of water. In this review article the biological denitrification efficiency was studied between free cell and cell amended metal nanoparticle such as nano scale zero valent iron (nZVI). This study investigated the potential applicability of employing metal nanoparticle as source of electron for biological nitrate reduction. Temperature, pH, nitrate concentration and dissolve oxygen concentration are the major factors affecting nitrate removal, with or without the presence of metal nanoparticles that studied in this article

کلمات کلیدی:

Water, Biological Denitrification, Metal Nanoparticles, Nano Scale Zero Valent Iron

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