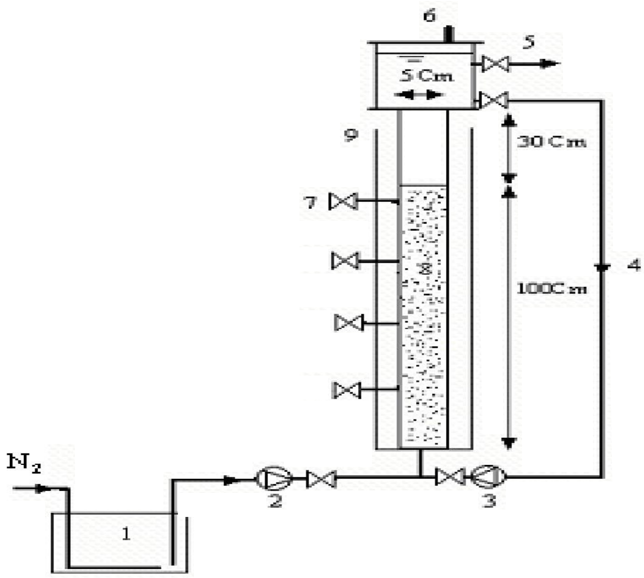
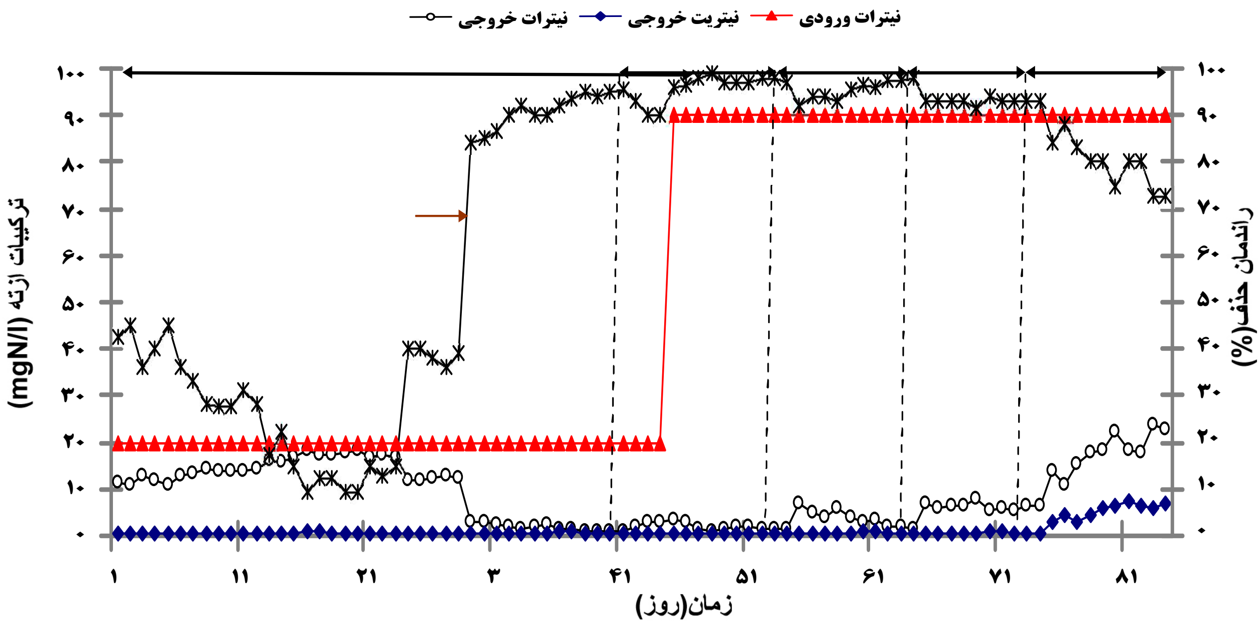
[illegible]

[illegible] nikaeen@hlth.mui.ac.ir [illegible]

[illegible] mg/L [illegible] pH [illegible]


6
5
5Cm
9
30 Cm
7
8
4
100Cm
N_2
2
3
1

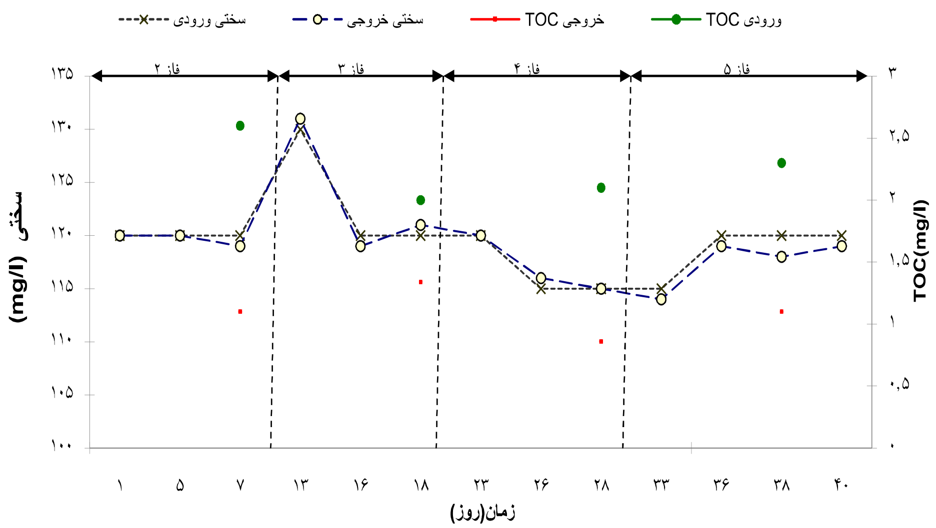

نیترات ورودی
نیتریت خروجی
نیترات خروجی
ترکیبات ازته (mgN/l)
راندمان حذف (%)
زمان(روز)
۱۰۰
۹۰
۸۰
۷۰
۶۰
۵۰
۴۰
۳۰
۲۰
۱۰
۰
۱
۱۱
۲۱
۳۱
۴۱
۵۱
۶۱
۷۱
۸۱

ĠŀǤŇŎř ŭǬŀŶƸƗƸŀ ǌǈŀƸ ǬŶ ŮƩƿƸƠ ǬŶ ƟƿǬƴŧ ƿ **pH** ƟŀƸŎŏŭ :ŀĶŬ

(Ĩƿħ ¡Ħ ¡ĥƸƘ) ƟƿƘǍŏ ŮŬŏƿǬƴĝ ƴƘŏ ǯƘƟƸ ǬŶ

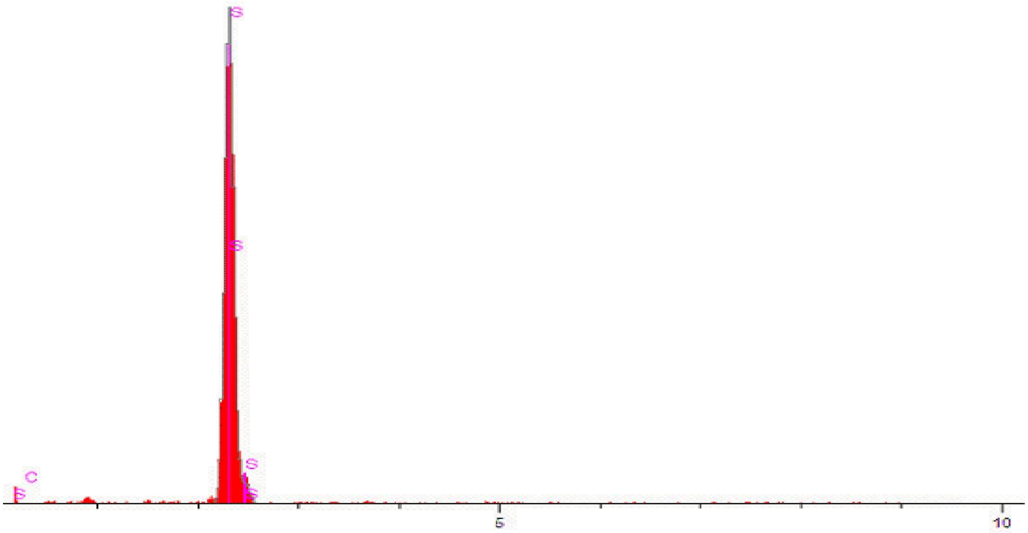
ƿ (Ĥ/Ĩ h ŮŬŏƿǬƴĝ ƴƘŏ ǯƘƟƸ) ǬŇŧŀǬ ƸŀƸ ŭǬŀŶƸƗƸŀ Ĩ ƸƘƏ ƟŀƸŎŀ Ŭzf ǬŶ ǬŇŧŀǬ ŮǉǬƘŧ Ĥ/ħĨ kgN/m³.d ŭǬŀzūǬƘŀ ƸƗ Ĥĝ mg/L ƸŀƗ ŀ ĠŀŮƩƿƸƠ ƟŀƸŎŀ ǯŀǯŏ ƿ ĠŀƏƘǉ ŀ ĝƘŧ ǰ ŀšǫĝ.ƠǮŀ ŀŴǬǮ (ěĨĥ ğƳƘūŏ Ŭzf ǯƘŏƴƘǬ) ƟƸŀ Ŀ ŝ f ǬŶ ŀƴŀ ĠŏĀdžŏ ƙƋ ǬŶ ƠŀƸŎŀ ƠŏǪŮ ƟŀƸŎŏŭŏ ĠŀŇǊŇƸŏ ƨǉƘŀ ŭăŀŏ ŭǬŀƗƸŀƸŀ ǌǈŀƸ ǬŶ ŭǬŀƗƸŀƸŀ ŮƿƸ ƸŀĨĦ d ğŇĂ

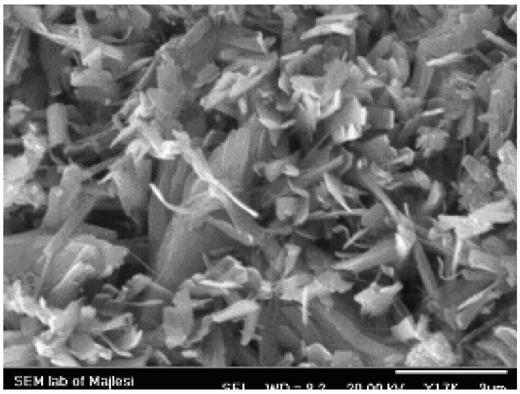
Ġŧ ĥ/ħ ¡ĥ/Ĭħ ¡Ĩ/ĨĦ ŮŬŏƿǬƴĝ ƴƘŏ ŭƘĝǯƘƟƸ ǬŶ ǫƿŀƴŏ ƿ ǯŇŀ ǯŀǯŏ Ġŧ ƠŝŀƠ ƸūǯƘŏ ƠǮŀ ŀƴƙ ŀƳƳ ǯƘǂŀ ĥ ĶŬ ǬŶ ƴŀš Ƹĝ .ƠǮŀ ŀƳŇŀ Ĥ mg/L Ƹŀ ƸƗǯŧ ŀǬŀŇǯĝ ŭƴŏŇŏ ƠŀƸŎŏŀ ƠŏǪŮ Ĥ/Ĩ h ŮŬŏƿǬƴĝ ƴƘŏ ǯƘƟƸ ƘŀǬŇŧŀǬ Ƹŀ ŭǬŀƗƸŀƸŀ ƘŀŀĠŀƘŀ ƙƋ ǬŶ ŮǯǮ ŀƳƘŏ ǰ ŀǯŀ ŮƩƿƸƠ ŀƴƙ ĠŏĀdžŏ ŀŏ ĠŀƿŀŀǯǬŀ ŀ .ƠǮŀ ŀŴǬǮ Ĥ mg/L Ƹŀ

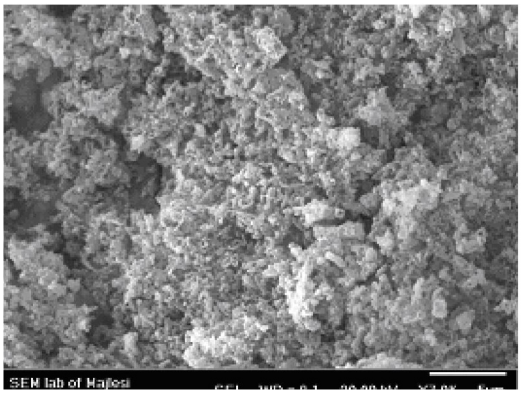


ĠŀǤŇŎř ŭǬŀŶƸƗƸŀ ǌǈŀƸ ǬŶ ŮƩƿƸƠ ƙƋ ǬŶ TOC)) Ůŀ ǰƸŧ Ķŧ ƿ ŮǤŀ ƟŀƸŎŏŭ :ħĶŬ

(Ĩƿħ ¡Ħ ¡ĥƸƘ) ƟƿƘǍŏ ŮŬŏƿǬƴĝ ƴƘŏ ǯƘƟƸ ǬŶ


S
S
S
C
5
10


SEM lab of Majlesi


SEM lab of Majlesi

$$1.1\ S^0 + No_3^- + 0.76\ H_2O + 0.4\ Co_2 + 0.08\ NH4^+ \xrightarrow{(\hat{H})} 1.1\ So_4^{2-} + 0.08\ C_5H_7No_2 + 1.28\ H^+ + 0.5\ N_2$$

[illegible]

ŭĺĸĿō

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Drinking Water Denitrification using Autotrophic Denitrifying Bacteria in a Fluidized Bed Bioreactor

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ABSTRACT

Background and Objectives: Contamination of drinking water sources with nitrate may cause adverse effects on human health. Due to operational and maintenance problems of physicochemical nitrate removal processes, using biological denitrification processes have been performed. The aim of this study is to evaluate nitrate removal efficiency from drinking water using autotrophic denitrifying bacteria immobilized on sulfur impregnated activated carbon in a fluidized bed bioreactor.
Materials and Methods: After impregnating activated carbon by sulfur as a microorganism carriers and enrichment and inoculation of denitrifying bacteria, a laboratory-scale fluidized bed bioreactor was operated. Nitrate removal efficiency, nitrite, turbidity, hardness and TOC in the effluent were examined during the whole experiment under various conditions including constant influent nitrate concentration as 90 mg NO3--N/l corresponding to different HRT ranging from 5.53 to 1.5 hr.
Results: We found that the denitrification rates was depended on the hydraulic retention time and the nitrate removal efficiency was up to 98% and nitrite concentration was lower than 1mg/l at optimum HRT=2.4 hr respectively. Moreover, there was no difference in hardness between influent and effluent due to supplying sodium bicarbonate as carbon source for denitrifying bacteria. However pH, TOC, hardness, and turbidity of the effluent met the W.H.O guidelines for drinking water.
Conclusion: This study demonstrated that an innovative carrier as sulfur impregnated activated carbon could be used as both the biofilm carrier and energy source for treating nitrate contaminated drinking water in the lab-scale fluidized bed bioreactor.

Keywords: Denitrification, Impregnated activated carbon, Autotrophic bacteria, Fluidized bed bioreactor

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