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Effects of Phosphorus and Nitrate in Wastewater Shahinshahr City Use for Oil Refinery

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ABSTRACT: Polymeric phosphates in detergents are used widely in construction and hence have a significant concentration in the wastewater. Phosphate may result in sewage and industrial waste is waste from the body. Phosphate caused a rapid growth of aquatic plants such as algae and it is disturbing factor in the treatment processes. For example, concentrations in the range ppm 2/0 in order to reduce the turbidity of water contract will play the role of the intruder. Nitrogen gas (N2) and the primary component of natural gas and the atmosphere is extremely stable. Nitrogen is a component of proteins. Chlorophyll and Nitrogen also is found in many biological compounds. Nitrate fertilizers polluting groundwater and surface water sources are in nature. Presentation of the nitrate concentration in milligrams per liter (Mg NO3\L) or milligrams per liter nitrogen as nitrate (Mg NO3-N\L) has caused many problems and errors. There is no significant difference between the two units. The combination of infection for humans in Europe the nitrate directive committee row is non-toxic compounds. This paper examines the effects of phosphate and nitrate in the plant in ShahinShahr Use of water, steam Oil Refinery reviewed and analyzed and the results are listed at the end.

KEYWORDS: Phosphate, Nitrate, Water Pollution, Water Treatment.

1 INTRODUCTION

A: PHOSPHORUS

Exclusively to the phosphate phosphorus (PO¬43) is found in the aquatic environment. There are several forms of phosphorus, including ortophosphates; condensed phosphates (follower, Meta-and poly-phosphates) and organic compounds are phosphates. This Even a minor component of the plant or animal tissue are considered. Building well-wide polymeric phosphates in detergents used, so have a significant concentration in the wastewater, Phosphate may result in sewage and industrial waste is waste from the body. Phosphates are not toxic and have no restriction on the Understand human health or bring other organisms directly, but indirectly serious threat to water quality is considered materials. Phosphate caused a rapid growth of aquatic plants such as algae and it is disturbing factor in the treatment processes. For example, concentrations in the range ppm 2/0 in order to reduce the turbidity of water contract will play the role of the intruder. Phosphorus in the water as a nutrient for growth microorganism considered. Orthophosphate and phosphorus in waters generally are classifide, orthophosphate of nutrients in the water is considered to be one of those problems, growth resulting in corrosion and biological will follow. Orthophosphate the project within 4 months was measured in two poly-phosphate and all experiments were carried out in the period under Vanadomolybdo phosphoric Colorimetric Method No. 4500-PC measurements were below standard. Standard Methods 09/12/2011 Shaheen refinery town on total phosphorus, mg\L 87/6 and it orthophosphate mg\L 8/5 was determined to be the result of the mg\L 07/1 and 15% of the total phosphorus forms in water. Polyphosphate if a water source is more than 75% of total

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phosphorus, phosphate treatment can be ignored. But given the repeated testing the figures come on 22/12/2011 and for total phosphorus, 3/5 orthophosphate and thus 61/1 poly phosphate (23% of the total), remove excess phosphate in water treatment plant design must be applied. Based on the research conducted and the results observed orthophosphate input to refineries should be close to zero. In addition to the problems mentioned above in the discussion of this matter, is increase the efficiency of corrosion inhibitors. According to the Environmental Protection Agency, the amount of in cooling towers less than ppm 5/1 is a must. According to a study in Orange County, Florida power plant that uses wastewater for cooling purposes, the value of p less than ppm 1 shall be controlling. The Palo Verde plant also recycles America project, the range of less than 0.5 milligrams of l. But according to the standards listed and the results of the what water, phosphate for the treatment is close to zero.

Table 1. Results Phosphate (Artvfsfat) Falcons Improved Water and City Water Dorcheh

Mg/L		DATA
What water	Falcon Shahinshahr	
0	6/1	2010/12/08
0/01	5/3	2010/12/09
-	7/41	2010/12/11
0	5/9	2010/12/13
-	6/11	2010/12/14
0	6/45	2010/12/16
-	5/2	2010/12/18
0	5/8	2010/12/20
-	5/3	2010/12/22
0	5/9	2010/12/24
-	6	2010/12/26

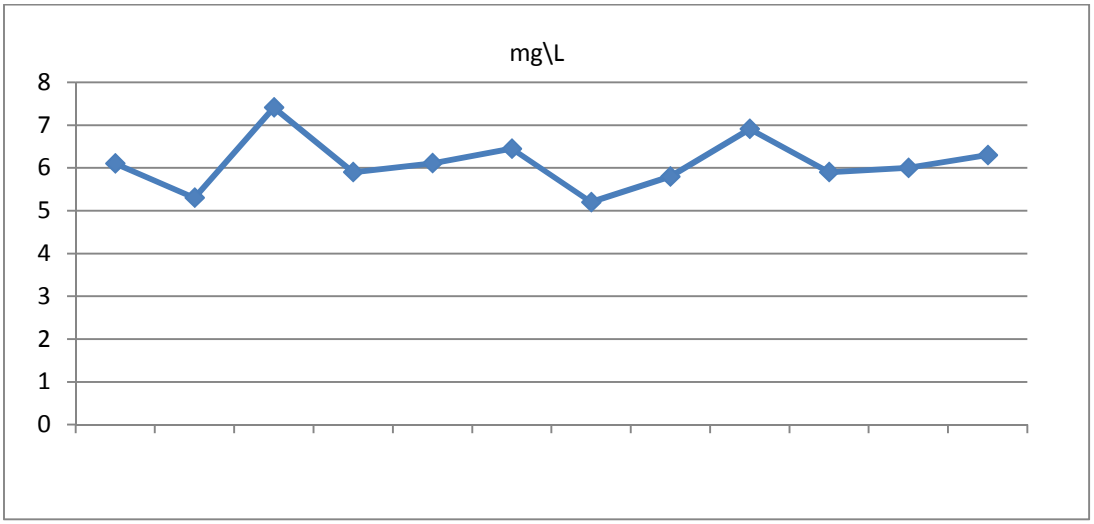

Fig. 1. Results in Phosphate-Falcons Reclaimed Water

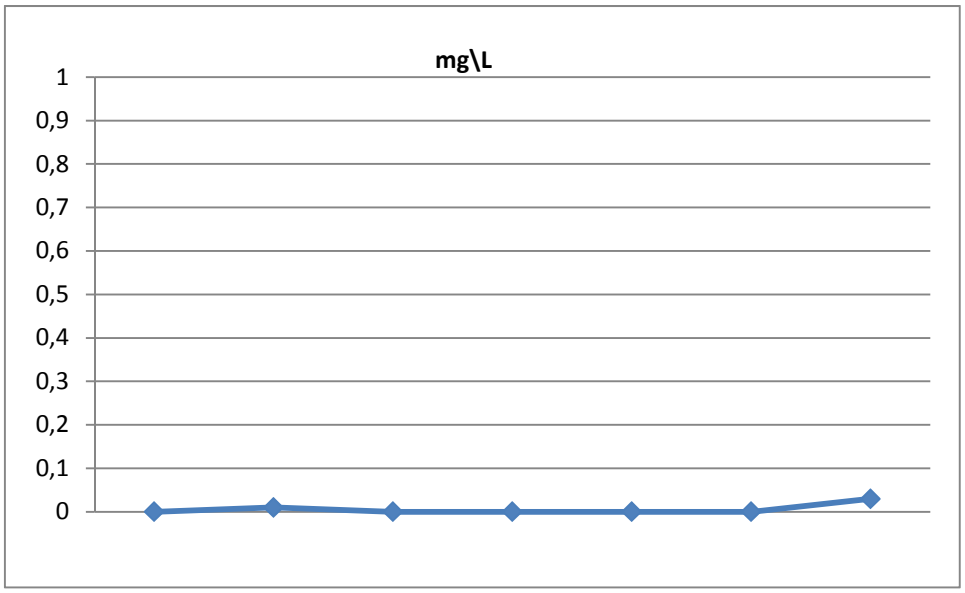

Fig. 2. What Results Phosphate Supply Water

According to available data, a consistent trend of Shahin phosphate in treated wastewater and the average ppm 11/6 is.

Table 2. Summarizes the Two Locations with the Standard Phosphate

Standard Range	What the Average Water	Average Effluent Shahinshahr	
0-1	NIL	6/11	Mg/L

B: NITRITE

Nitrogen gas (N_2) and the primary component of natural gas and the atmosphere is extremely stable. Under conditions of very high energy, the gas reacts with oxygen (burning with flame or electrical discharges) of this reaction, nitrogen oxides occur. Although a small number of Capable of biological species to nitrogen dioxide to the nitrogen in the aquatic environment mainly comes from sources other than atmospheric nitrogen. Nitrogen is a component of proteins. Chlorophyll and Nitrogen also is found in many biological compounds. After the death of animals, plants or microbial decomposition of complex Examples of proteins into amino acids and then to ammonia (NH_3) are. If there is oxygen, ammonia to nitrite (NO^{2-}) and then to nitrate (NO^{3-}) is oxidized. Other sources of nitrogen in the water systems of animal excrement, chemicals (especially compounds used as fertilizer) and is discharged waste stream. The sources of nitrogen may Natural and waste water can penetrate. Nitrite standard by Germany TRUMPF Inc. ppm 1 is less often due to the unstable nature of this compound is not very important, and therefore more attention on directly into Natural and waste water can penetrate. Nitrite standard by Germany TRUMPF Inc. ppm 1 is less often due to the unstable nature of this compound is not very important, and therefore more attention..... Colorimetric method 4500-NO_2-B Standard Issue Standard Methods for the Examination of Water and Wastewater was measured.

Table 3. Results of Nitrite in Water and Waste Water Shahinshahr City

Mg/L		Date
Dorche Water	Wastewater Shahinshahr City	
0/02	3/04	2010/12/08
0/023	0/39	2010/12/09
-	0/082	2010/12/11
0/046	1/78	2010/12/13
-	0/046	2010/12/14
0/006	5/65	2010/12/16
-	1/41	2010/12/18
0/01	0/03	2010/12/20
-	3/9	2010/12/22
0/003	4/96	2010/12/24
-	4/47	2010/12/26

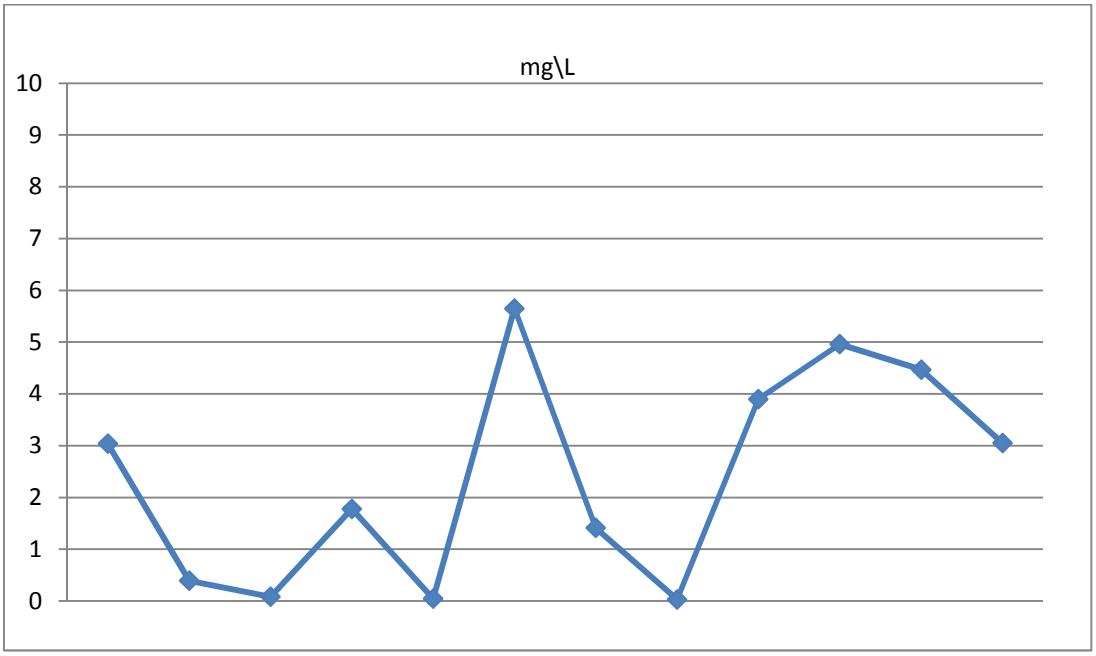

Fig. 3. Results in Reclaimed Water Nitrite Shahinshahr

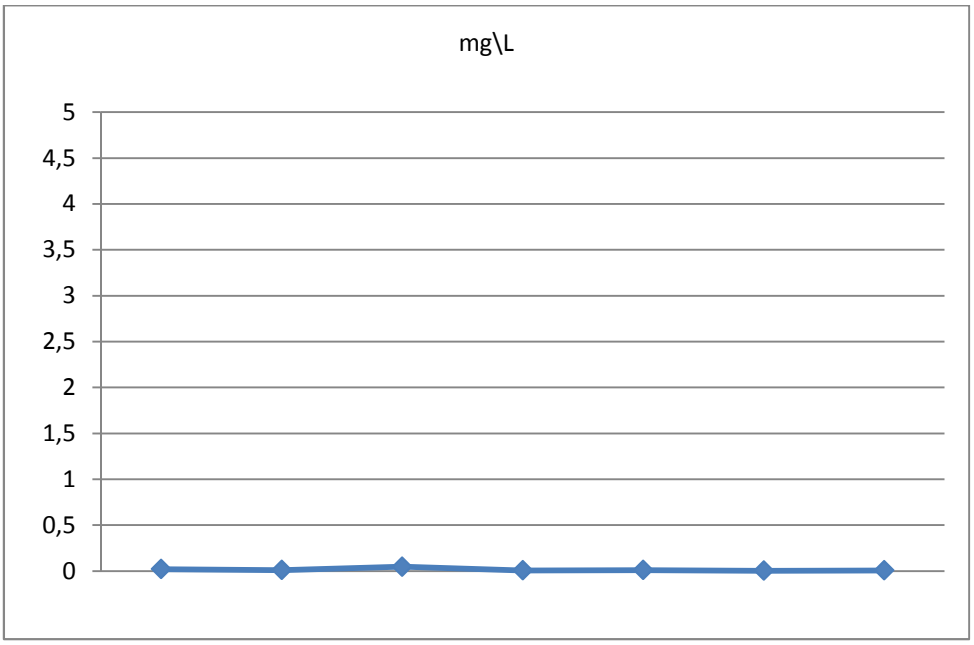

Fig. 4. What Results from Water Supply

According to available data, Shahin Shahr nitrite in wastewater by almost no uniform trend could be due to lack of proper maintenance and operation of biological wastewater treatment reactor inlet flow rate increases when (precipitation) Zemestan as well as reducing is temperature. Average concentration to ppm 5/2, which is scheduled to present a strategy for reducing, controlling and even these parameters are listed in the report.

Table 4. Summarizes the Situation with Two Locations Nitrite Standard Range

The scope of the standard (Maximum)	What the average water	Average effluent Shahinshahr		
		Long-term	Short-term	
<1	0/015	3/8	2/5	Mg\L

2 CONCLUSIONS

A: NITRATES

Nitrate fertilizers most polluting groundwater and surface water sources are in nature. Presentation of the nitrate concentration in milligrams per liter (Mg NO_3\ L) or milligrams per liter of nitrate nitrogen in (Mg NO_3-N \ L) has caused problems and errors. There is no significant difference between the two units, for example, NO_3\L 50 mg equivalent NO_3-L_3/11 mg is. In this discussion, the actual concentration of nitrate is used as the Mg NO_3\L is presented. The conversion of NO_3\L as Mg NO_3-N\L must be in 226/0 beat the charges. The combinations of infection for humans, the Nitrates are toxic compounds Europe Committee of instructions in a row. The maximum instruction, 50 to 100 milligrams per liter has been determined. But in 1984, the complication rate of red blood cell deficiency in children, the standard recommended by the World Health Organization to override the limit in terms of the NO_3-N\L 10 mg or (NO_3\L 45 milligrams) reduced. Nitrate concentrations in surface waters have been rising in recent years, it has seasonal fluctuations of this fall and winter concentration is at its highest when the project tests this season, decisions based on these parameters is critical. problems the nitrate industry, including increasing the amount of solids is usually not significant, and the nitrates are in the control of boilers fragility. The result of long-term nitrate treatment plant effluent hawk is visible in Figure 6. towers and water nitrate standard input to refineries, according the Global Environment, because of the dangers of and biological problems under control Mg NO_3\L 5 is. But given the supply of water What, Isfahan refinery facilities in

recent years due to drought and low river flow, with an average concentration of aqueous Mg NO_3\L 18 has been kept in operation.

Table 5. Results in Nitrate Wastewater and Water Supply Shahinshahr

Mg/L		date
	Falcon City wastewater	
4/43	23/91	2010/12/08
4/41	6/64	2010/12/09
-	9/29	2010/12/11
6/19	14/16	2010/12/13
-	18/59	2010/12/14
5/47	13/281	2010/12/16
-	15/05	2010/12/18
6/64	27	2010/12/20
-	22/6	2010/12/22

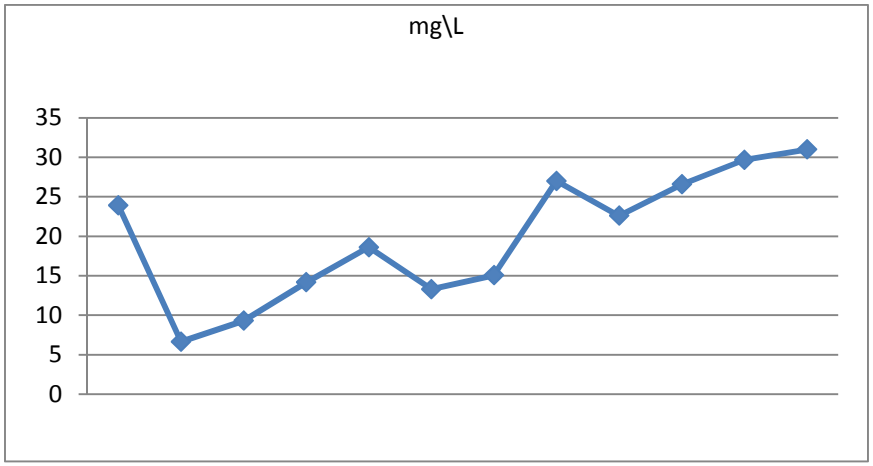

Fig. 5. Results in Reclaimed Water Nitrate Shahinshahr

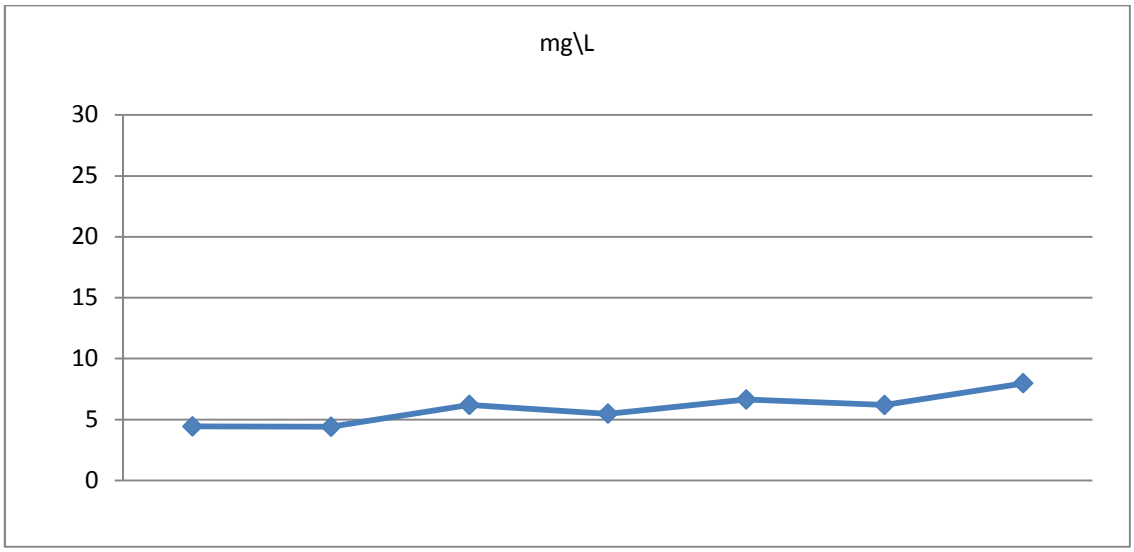

Fig. 6. Conclusions Nitrate Irrigation Water

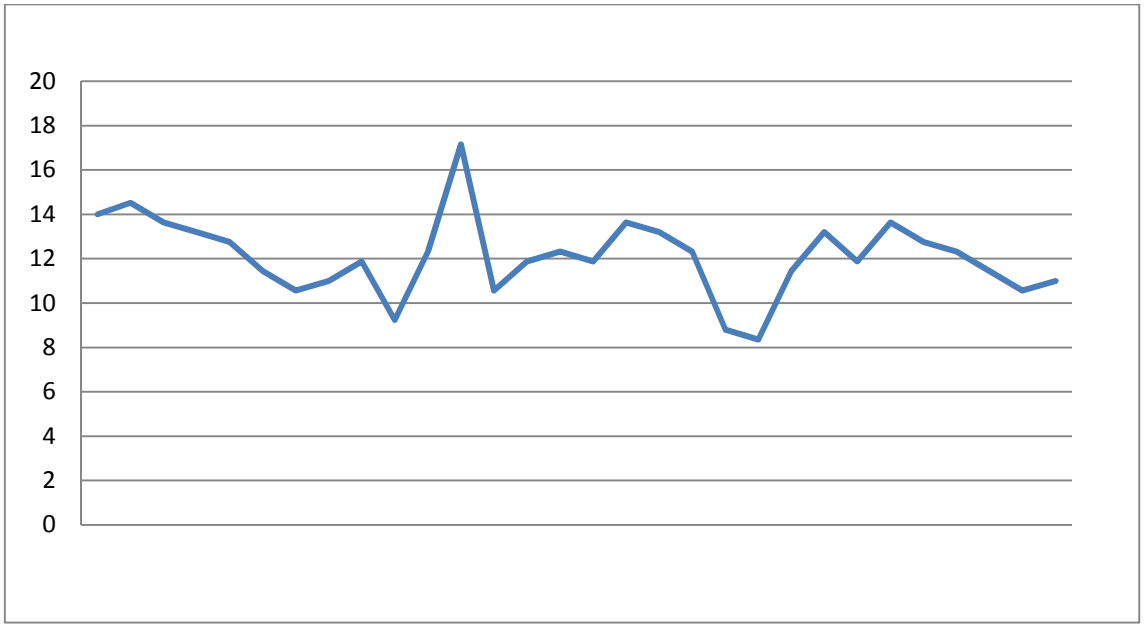

Chart 7. Results in Nitrate Effluent Treatment Plant and Waste Water Laboratory Results of ShahinShahr

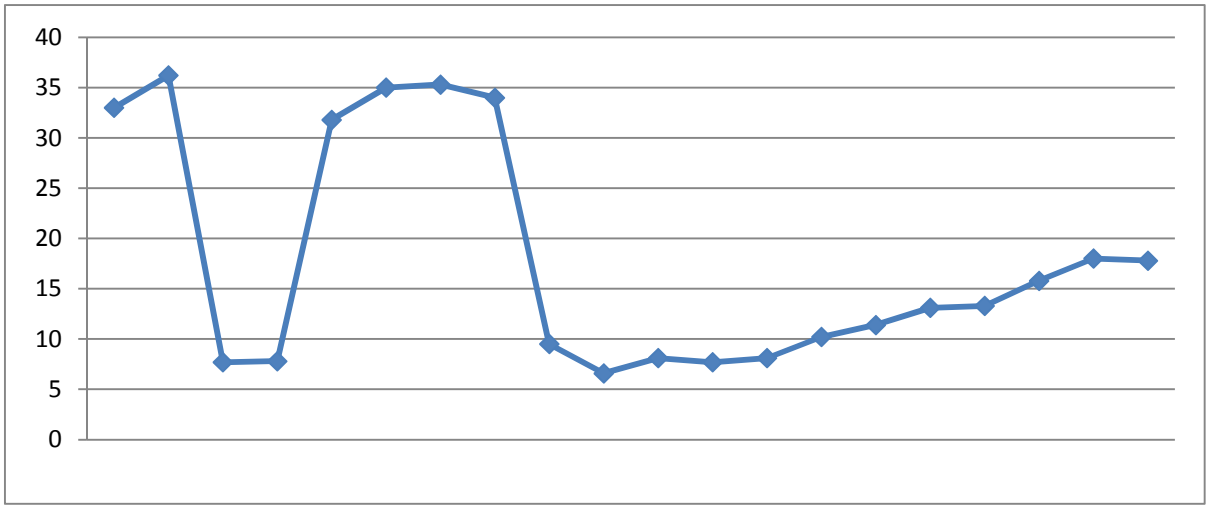

Chart 8. Supply Water Nitrate Results Based on Laboratory Results Oil Refinery

According to available data, the nitrate in the effluent as it can cause no uniform trend of Shahin Shahr almost nitrite, of proper maintenance and operation of biological treatment reactors Dubai house when increasing input (precipitation) low temperatures in winter. Average concentration equal to 8/19 that the amounts of rainfall and drought years, the supply of water what is the same in the cold months of the year, along with rainfall more, Also, due to increased nitr Cold seasons due to lower temperatures and correspondingly reduced biological activity is microorganism the reactor treatment plant in Shahin Shahr. In order to reach the standard of the nitrate concentration of $MgNO_3$\L 15 is greater than the standard. According to the experiments and researches done, it can be concluded that the wastewater treatment plant Shahin Shahr, Isfahan refineries have great potential for use Drmsarf is especially cooling towers. Health concerns about wastewater serious consideration should be made and the system is secure from any interruption or failure in the disinfection process. Because of the unknown effects of some contaminants present in water is modified due to Isfahan Refinery, would be challenging. Falcon City wastewater treatment plant and transfer its excess refining the human and environmental benefits, the economic benefits of a well to a refinery will bring. There was hardly example effluent what the Falcons at home in water than water and this will reduce sedimentation and other technical issues. Also, lower

concentrations of heavy metals in wastewater treatment plants, water supply Shaheen What improvement in the of refinery workers also pose public health.

REFERENCES

[1] Samimi, Amir, Zarinabadi, Soroush, "An Analysis of Polyethylene Coating Corrosion in Oil and Gas Pipelines," Journal of American science, U.S.A., 2011.

[2] Zarinabadi, Soroush, Samimi, Amir, "Scrutiny Water Penetration in Three-layer Polyethylene Coverage," Journal of American science, U.S.A., 2011.

[3] Samimi, Amir, Zarinabadi, Soroush, "Reduction of greenhouse gases emission and effect on environment", Australian journal of basic and applied science, pp. 752-756, 2011.

[4] Zarinabadi, Soroush, Samimi, Amir, "Problems of hydrate formation in oil and gas pipes deal," Australian journal of basic and applied science, 2011.

[5] Zarinabadi, Soroush, Samimi, Amir, Erfan Ziarifar, Mohammad Sadegh Marouf, "Modeling and Simulation for Olefin Production in Amir Kabir Petrochemical," Proceedings of the World Congress on Engineering and Computer Science 2010 Vol II WCECS, San Francisco, USA, 2010.

[6] Samimi, Amir, Zarinabadi, Soroush, "Application Polyurethane as Coating in Oil and Gas Pipelines", International Journal of science and investigations, France, pp.43-45, 2012

[7] Samimi, Amir, Zarinabadi, Soroush, Samimi, Marzieh, "Solar Energy Application on Environmental Protection", International Journal of science and investigations, France, pp.21-24, 2012

[8] Samimi, Amir, Almasinia, Babak, Nazem, Esmaeil, Rezaei, Rohollah, Hedayati, Abbas, Afkhami, Mahbobeh, "Investigating MIDEA Corrosion Treatment on Carbonic Simple Steel in Amin Unit of Isfahan Refinery", International Journal of science and investigations, France, 2012

[9] Samimi, Amir, "Investigation Results of Properties of Stripe Coatings in Oil and Gas Pipelines", International Journal of science and investigations, France, 2012

[10] Samimi, Amir, "Studying Corrosion Electrochemical Mechanism in Tube Line and Gas Wells", International Journal of science and investigations, France, 2012

[11] Samimi, Amir, "Preventing Hydrate Formation in Gas Transporting Pipe Lines with Synthetic Inhibitors", International Journal of science and investigations, France, pp.48-50, 2012

[12] Samimi, Marzieh, Samimi, Amir, " Non-Climatically Factors Causing Weather Changes", International Journal of science and investigations, France, pp.35-31, 2012

[13] Samimi, Amir, Zarinabadi, Soroush, Setoudeh, Mehrdad, "Experimental Study of Factors Affecting Corrosion in Gas Wells Using Potantio Acetate and Galvan Acetate Tests," International Journal of science and investigations, France, 2012

[14] Samimi, Amir, Zarinabadi, Soroush, Setoudeh, Mehrdad, Safavian, Amir, "Review Applications to Prevent Corrosion Reducing Gas Pipe Line", International Journal of Basic and Applied science, Indonesia, pp.423-428, 2012

[15] Samimi, Amir, Zarinabadi, Soroush, Setoudeh, Mehrdad, "Safety and Inspection for Preventing Fouling in Oil Exchangers," International Journal of Basic and Applied science, Indonesia, pp.429-434, 2012

[16] Samimi, Amir, Zarinabadi, Soroush, "The Comparison of Increasing Method for Petroleum Pits Output (Fluids Dynamic)," International Journal of Basic and Applied science, Indonesia, pp. 435-439, 2012.

[17] Samimi, Amir, Afkhami, Mahbobeh, "Check Solution Corrosive a–MEDA on 316 & 304 Stainless Steel in Hydrogen Unit", International Journal of Basic and Applied science, Indonesia, pp.594-604, 2012

[18] Samimi, Amir, "Review Applications to Prevent Corrosion Reducing Gas Pipe Line", International Journal of Basic and Applied science, Indonesia, pp.423-428, 2012

[19] Samimi, Amir, "Causes of Increased Corrosion in Oil and Gas Pipelines in the Middle East", International Journal of Basic and Applied science, Indonesia, pp.572-577, 2012

[20] Samimi, Amir, Dokhani, Sepanta, Neshat, Neda, Almasinia, Babak, Setoudeh, Mehrdad, "The Application and New Mechanism of Universal Produce the 3-Layer Polyethylene Coating," International Journal of Advanced Scientific and Technical Research (IJAST), India, pp. 465-473, 2012.

[21] Samimi, Amir, "Normal Paraffin Production Process of Kerosene in Oil Refinery Company", International Journal of Innovation and Applied Studies, ISSN 2028-9324 Vol. 1 No. 2 Dec. 2012.

[22] Samimi, Amir, "Offer a New Model to Prevent Formation of Hydrate in Gas Pipeline in Gas Refinery", International Journal of Innovation and Applied Studies, ISSN 2028-9324 Vol. 1 No. 2 Dec. 2012.

[23] Samimi, Amir, "Study an Analysis and Suggest New Mechanism of 3 Layer Polyethylene Coating Corrosion Cooling Water Pipeline in Oil Refinery in Iran", International Journal of Innovation and Applied Studies, ISSN 2028-9324, Dec. 2012

[24] Samimi, Amir, "Use of Polyurethane Coating to Prevent Corrosion in Oil and Gas Pipelines Transfer", International Journal of Innovation and Applied Studies, ISSN 2028-9324 Vol. 1 No. 2 Dec. 2012.

[25] Samimi, Marzieh, Samimi, Amir, "Explotion of Resources Management in Iran", International Journal of Innovation and Applied Studies, ISSN 2028-9324 Vol. 1 No. 2 Dec. 2012.
[26] Samimi, Amir, Zarinabadi, Soroush, "Investigation of Corrosion of the Pipeline Using TOEFLT in Iran Refinery", International Journal of Innovation and Applied Studies, ISSN 2028-9324 Vol. 1 No. 2 Dec. 2012.
[27] Setoudeh, Mehrdad, Samimi, Amir, Zarinabadi, Soroush, Almasinia, Babak, Nazem, Esmaeil, Rezaei, Rohollah, hedayati, Abbas, "Experimental Study of Factors Affecting Corrosion in Gas Wells Using Potantio Acetate and Galvan Acetate Tests", International Journal of science and investigations, pp. 13-16, 2012.
[28] Zarinabadi, Soroush, Samimi, Amir, "Scrutiny Water Penetration in Three-layer Polyethylene Coverage," International Congress of Chemical and Process Engineering , CHISA 2010, and 15 Conference on Process Integration, Modelling and ptimisation for Energy Saving and Pollution, 2010.
[29] Samimi, Amir, Zarinabadi, Soroush, "Application Solid Polyurethane as Coating in Oil and Gas Pipelines," International Congress of Chemical and Process Engineering, CHISA 2012, and 16 Conference on Process Integration, Modelling and ptimisation for Energy Saving and Pollution, 2012.
[30] Zarinabadi, Soroush, Samimi, Amir, "Investigation Results of Properties of Stripe Coatings in Oil and Gas Pipelines," International Congress of Chemical and Process Engineering, CHISA 2012, and 16 Conference on Process Integration, Modelling and ptimisation for Energy Saving and Pollution, 2012.

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