Reply to Referee 1

Dear Professor

Thank you very much for your valuable comments

Regarding your important comments:

(1) The word "Optimization" in the title appears to be for the quality of shallow groundwater, while authors aimed to find the optimal solution for the protection of the area from this contaminated shallow groundwater (Page 3, Line 5). Thus, the title is not understandable in terms of doing the optimization for the water treatment or for the selection of the best solution.

The word "Optimization" in the title is for the quality of shallow groundwater to solve the problem of water contamination and reuse of water instead of its injection into the underline groundwater Miocene aquifer, the sentence in page 3 line 5 was changed into "So, the scope of the present study is to determine the water quality from the different drilled wells in El Obour city according to its content of some heavy metals and biological loads. Moreover, to solve the problem of water contamination and reuse of water instead of its injection into the underline groundwater Miocene aquifer through, application of advanced photocatalytic techniques for water treatment by using nitrogen-doped TiO_2 photocatalyst in the degradation and mineralizing a wide class of bacteria using the UV-visible light."

(2) In the Abstract, authors mentioned that the main pollutants in the collected 28 samples are Cd and Pb (Page 1, Line 16), while there is no information in the whole manuscript about these two heavy metals.

The sentence was removed from abstract

(3) In the Introduction: # (Page 2, Line 22), why in contrast? The two sentences have the same meaning that photocatalysis is a promising solution for water treatment.

"In contrast, application of semiconductor photocatalysis by"
Replace by
"Application of semiconductor photocatalysis by"

(Page 2, Line 29), the sentence for description the nitrogen doped TiO2 is not completed

"In the last years, anion doping of TiO2 films and powders with elements like nitrogen"
Replace by
"In the last years, anion doping of TiO2 films and powders with elements like nitrogen has been investigated"

The novelty of this research article is very low, especially author used known and published photocatalytic technique with nitrogen doped TiO2 in bench-scale (Reference: Cong et al., 2007)

The novelty of this research article concerns with the treatment of organics and bacteria in actual matrix in true water using photocatalytic technique in presence of TiO_2 doped with nitrogen.

Standard methods is preferred to be reference for the method of determination of COD (Page 3, Line 20).

The Chemical Oxygen Demand (COD) was determined by K2Cr2O7 open reflux method (El Nazer et al., 2017, APHA, 1998). Four representative samples were selected for treatment technique.

Authors referred to Cong et al., 2007, for the preparation of nitrogen doped TiO2. They used urea as a source for nitrogen with molar ratio titanium n-butoxide: urea (1:5), which is higher than was studied by Cong et al, 2007. Also, the urea is not the best source of nitrogen as found by Cong et al, 2007. In addition, no further treatment process for the obtained N-doped titania after the hydrothermal process, while authors calcined the obtained powder at 400 ◦C for 4 h. This will change the crystalline characteristics of the final product totally. Authors did not explain why they changed the preparation method that established by Cong et al, 2007.

“TNBT solution and urea was taken in the mole ratio 1:5.”
Replace by
“TNBT solution and urea was taken in the mole ratio 5:1.”

(Cong et al., 2007)
Replace by
(Wael et al., 2015)

In Photocatalytic Reactions Section, C2 DWESD Interactive comment Printer-friendly version Discussion paper holes are not the only oxidizing species in the process, what about the hydroxyl radicals and the super oxide oxygen?

hydroxyl radicals and the super oxide oxygen are formed in certain conditions i.e. higher pH by adding NaOH and addition of H_2O_2. In the present investigation NaOH or H_2O_2 were not added.

The visible light lamps with wavelength 400–700 nm range were used for the photocatalytic degradation process and this is not fair for showing the effect of the photocatalyst. This catalyst can be activated also in UV range from 300 nm as the solar

light start from this wavelength and authors mentioned that this process can be done by solar light (see Abstract and Conclusions Sections).

The prepared photocatalysts could absorb light from 400 to 700 nm as mentioned before in our previous article (Wael et al., 2015)

(6) The recommended treatment process was done in bench-scale with only 4 collected samples at fixed operation time (60 min). There is no information about the reaction kinetics. In addition, authors did not treat the problem of scaling up this heterogeneous photocatalytic process with large water volume, especially they mentioned that there are plenty of wells in the City. In addition, what about the cumbersome separation method of the nano-catalyst from the treated effluent.

The present investigation concerns with investigation of optimum conditionsfor photocatalytic treatment of collected samples in bench scale. In large scale the nano-photocatalysts would immobilized on substrates i.e Zeolites or Bentonites in fixed bed reactors since the catalysts are completely separated from the wastewater.

(7) The number of references (51) is so high for research article.

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