4. Conclusions

Using of an experimental design technique such as Taguchi method can help to reduce the number of experiments for optimization of photodegradation process of wastewater sample. The Taguchi experimental design showed that the nitro-bodies compounds in the yellow water sample of TNT production were destructed more than 92% in optimized conditions. The controlled factors are optimized in doped TiO_2 nanoparticles with 10% wt. of nitrogen as photocatalyst, photocatalyst concentration of 1.5 $g{\cdot}L^{-1}$ of, dilution times of 750 of preliminary sample and photodegradation time of 20 h.

The optimized photocatalyst of $TiO_2/N_{0.1}$ presented the structure of anatase and rutile phases, nanoparticles size of less than 30 nm, band-gap energy of 2.92 eV and surface area of 150 $m^2{\cdot}g^{-1}$. The multiple linear regression (MLR) method indicated a meaningful relationship between the predictor's value and the response variable in the proposed model. The verification of photodegradation efficiency responses was confirmed by P-values of MLR technique data.

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