RhB degradation at minimum catalyst dosage, optimal initial pH, irradiation time and high initial concentration of the RhB. The optimal conditions were found at catalyst dosage, initial pH irradiation time and initial concentration of 0. 75g.L^{-1}, 4.6 - 7, 120 min and 12.5 mg.L^{-1} to achieve complete RhB degradation. The optimal experiment predicted by modeling was experimentally tested, in order to further assess the validity of the model. The response of experiment (RhB degradation) was 95%. Consequently, the validity and adequacy of the model were verified.

4. Conclusion

The nano-sized Bi_2O_3 was synthesized via a precipitation method and its photocatalytic activity was tested in degradation of Rhodamine B. The modeling of the process allowed to study the interaction of the binary factors and prediction of the degradation of Rhodamine B in different conditions. The relative importance of the independent factors of the process, suggested by Pareto analysis was as follows: Adsorbent dosage > initial pH ≈ irradiation time > dye concentration. Among binary terms of the model, interaction of adsorbent dosage- initial pH exhibited the prominent effect on the degradation of the dye. The results indicated that the photocatalytic degradation of RhB in acidic condition is much higher than in alkaline condition. The nano-Bi_2O_3 exhibited good photocatalytic activity in degradation of RhB under UV light.

Acknowledgements

The authors are grateful to Iran Nanotechnology Initiative Council for the financial support from this project.

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