In this paper, photooxidative removal of C.I. Basic Red 46 (BR46) as a model organic pollutant was investigated in the presence of UV/inorganic oxidants system. The aim of this study was to evaluate the efficiency of hybrid oxidant system including inorganic oxidant species such as persulfate ($S_{2}O_{8}^{2-}$), peroxymonosulfate ($HSO_{5}^{-}$), periodate ($IO_{4}^{-}$), bromate ($BrO_{3}^{-}$), and chlorate ($ClO_{3}^{-}$) under UV-C light irradiation. The effect of various inorganic oxidants concentration in different reaction times was predicted and optimized in the photooxidation process using response surface methodology. It was found that the concentration of inorganic oxidants significantly affected the removal rate of BR46. Modeling results showed that the predicted values of removal efficiency were found to be in good agreement with the experimental results with a correlation coefficient ($R^2$) of 0.9462. Optimization results showed that maximum removal efficiency (95.51%) was achieved at the optimum oxidants concentration: $BrO_{3}^{-}$ of 118 mg L$^{-1}$, $ClO_{3}^{-}$ of 24 mg L$^{-1}$, $S_{2}O_{8}^{2-}$ of 1035 mg L$^{-1}$, $HSO_{5}^{-}$ of 232 mg L$^{-1}$ and $IO_{4}^{-}$ of 267 mg L$^{-1}$ in reaction time of 23 min. Effect of oxidants concentration on the photooxidative removal of BR46 was estimated by the response surface and contour plots. Furthermore, the photooxidative removal efficiency of hybrid oxidant system mode was compared with individual processes. The obtained results clearly demonstrated that experimental design approach was one of the useful and cost-effective methods for modeling and optimizing the efficiency of UV/inorganic oxidants system. Mineralization study showed 84.4% reduction in total organic carbon value after 90 min of process.

**Keywords:** Inorganic oxidants system; Optimization; Oxidants concentration effect; Response surface methodology; C.I. Basic Red 46