CHAPTER VIII
CONCLUSIONS

The present work demonstrated the preparation of bismuth alkoxide and the use of it as a precursor for synthesis bismuth titanate. This precursor is non-toxic, high purity, and facile storage. Bismuth alkoxide precursor facilitated the synthesis of perovskite bismuth titanate via sol-gel process (Chapter IV). The structure of bismuth alkoxide precursor could be controlled through adjusting synthesis condition i.e., metal ion concentration, reaction time, and reaction temperature. Two dimensional platelike structures were assembled to three dimension flower like structures. The different types of flower like structures were received by changing metal ion concentration. Bismuth alkoxide was calcined to get bismuth oxide (Chapter V). Sillenite bismuth titanate ($Bi_{12}TiO_{20}$) has the absorption onset wavelength of visible region (around 500 nm), meaning that it has a possibility to be used under weak UV light or sunlight. So the photocatalytic activity was tested toward dye degradation. Reactive black 5 was used as a dye model. Moreover, its photocatalytic activity was compared to TS-1 zeolite catalyst in which Ti-centered dispersed in zeolite framework. The effect of pH, H_2O_2 concentration and Si/Ti ratio of the zeolite was explored, as assessed by degree of decoloration and mineralization (loss of total organic content) (Chapter VI). Hierarchical architecture sillenite bismuth titanate ($Bi_{12}TiO_{20}$) was synthesized by heating bismuth nitrate and titanium butoxide in ethylene glycol. The morphology of the structure was controlled by adjusting the reaction time. The leaf and circular plate was achieved by heating the mixture for 30 min, and it completely transformed to three dimension structure within 2h (Chapter VII).