Abstract

Chapter 1: In chapter 1, we have presented a brief introduction on photodetector and its various applications.

Chapter 2: Chapter 2 is the discussion about experimental methods and characterization tools. In this chapter, we have briefly discussed the experimental methods we have used for preparation of our materials. Then, we have discussed the characterization techniques we have used to characterize our prepared materials.

Chapter 3: We have prepared graphene oxide thin film by spin coating. Then, we have reduced it by hydrazine vapour to obtain reduced graphene oxide thin film. We have studied the photodetection properties of reduced graphene oxide thin film.

Chapter 4: Recently, there is a surge of preparation methods for reduced graphene oxide. But most of the times, many of its properties are not explored. In this chapter, we have explored infrared photodetection properties of metal reduced graphene oxide.

Chapter 5: In chapter 5, we have shown enhanced infrared photodetection by solvothermal reduced graphene oxide. Responsivity values of our photodetectors are comparable with many graphene-based photodetectors.

Chapter 6: We have presented our work on highly responsive infrared detector based on reduced graphene oxide in chapter 6. We have studied infrared detection by our photodetectors. We have done experiment to find out the bolometric contribution to the photocurrent.

Chapter 7: Ultraviolet photodetection by ZnO-nanosheets-decorated reduced graphene oxide has been studied in this chapter. ZnO-nanosheets film shows very less UV photo response. In case of reduced graphene oxide current value decreases during UV illumination. But, after
drop casting ZnO-nanosheets on reduced graphene oxide film significant enhancement in photocurrent has been observed.

Chapter 8: This chapter is about summary of research works and future works.