Contents

Sr. No		Page No
	Chapter 1	
	Introduction	
1.1	**General Introduction of Nanoparticles/Nanocrystals**	1-2
1.2	**Classification**	3-5
1.3	**Synthesis of Nanoparticles**	6-7
1.4	**Properties of Nanoparticles**	7-9
1.5	**Applications**	10-18
1.6	**References**	19-24
	Chapter 2	
	Benzylic C_{sp3}-H Bond Oxidation on (111) Facets of *o*-Cu_2O Nanocrystals: C-H Bond Activation through Semiconductor Facets Mediated Catalysis.	
2.1	**Introduction**	26-28
2.2	**Synthesis of *o*-Cu_2O NCs**	29
2.3	**Characterization**	30-31
2.4	**Results and Discussion.**	31-59
2.6	**Conclusion**	60-71
2.7	**References**	72-75
	Chapter 3	
	Differentiating the (100) surfaces of Cu_2O Nanocrystals from (111) and (110) for Benzylic Csp^3-H Bond Oxidation: Oxidations of Diphenyl Methane to Benzophenone and Cumene to Cumene Hydroperoxide under Mild Conditions.	
3.1	**Introduction**	78-81

3.2	**Synthesis**	81-83
3.3	**Characterization of synthesized *c*-Cu_2O and *d*-Cu_2O NCs**	83-84
3.4	**Result & discussion**	84-108
3.5	**Conclusion**	108-115
3.6	**References**	115-120

Chapter 4

Synthesis and characterization of Fe, Ni (dual Metal-Metal) doped ZnS NPs and their photocatalytic activity.

4.1	**Introduction**	122-124
4.2	**Synthesis**	124-125
4.3	**Characterization**	125-126
4.4	**Result & Discussion**	126-153
4.5	**Conclusion**	153-154
4.6	**References**	155-158

Chapter 5

Synthesis and characterization of Fe, B (dual Metal- Non-metal)) doped ZnS NPs and their photocatalytic activity.

5.1	**Introduction**	159
5.2	**Synthesis**	160
5.3	**Characterization**	160
5.4	**Result & Discussion**	161-172
5.5	**Conclusion**	172-173
5.6	**References**	174-176