List of tables:

Chapter	Table	Title	Page no
2(Section 2.1)	1	Comparisons of metals contents (in ppm) in 'WERSA' using Ion-Exchange chromatography and Flame photometry analysis.	26
	2	Optimization of reaction condition for catalyst and solvent	28
	3	Rice straw ash promoted Suzuki-Miyaura cross-coupling reaction of aryl bromides and arylboronic acids	30
2(Section 2.2)	1	Optimization of reaction condition for catalyst, base, solvent	45
	2	Cross-coupling of aryl diazonium salt and arylboronic acid	46
2(Section 2.3)	1	Screening of the reaction condition for solvent, catalyst and base	59
	2	Pd NPs@graphene catalysed Sonogashira reaction	60
3(Section 3.1)	1	Comparison between flame photometry and ion-exchange chromatography result of banana peel extract	28
	2	Optimization of the reaction condition for catalyst, ligand and solvent	30
	3	Reaction scopes of the protocols using different arylboronic acids and *N*-nucleophiles	31
3(Section 3.2)	1	Optimization of reaction condition for different nitrate salt	43
	2	Optimization of reaction condition for different additives, nitrate salt and amount of the catalyst	45
	3	Effect of different solvents on the reaction	45
	4	Molecular iodine catalyzed synthesis of nitrobenzenefrom aryl boronic acids	47
	5	Relative energies (kcal mol^{-1}) of species involved in the reaction calculated at DFT (B3LYP) and levels of theory	51
	6	Coordinates (in Ås) of each atom of optimized $Zr(O)(H_2O)(NO_3)_2$	60
	7	Coordinates (in Ås) of each atom of optimized RC	60
	8	Coordinates (in Ås) of each atom of optimized TS	60

	9	Coordinates (in Ås) of each atom of optimized PC	61
	10	Coordinates (in Ås) of each atom of optimized $Zr(O)(NO_3)I(H_2O)$	61
	11	Coordinates (in Ås) of each atom of optimized arylboronic acid ($BC_6H_7O_2$)	62
	12	Coordinates (in Ås) of each atom of optimized Reagent (NO_3I)	62
	13	Coordinates (in Ås) of each atom of optimized Nitrobenzene ($C_6NH_5O_2$)	62
	14	Coordinates (in Ås) of each atom of optimized byproduct (BH_2O_3I)	63
	15	Energies, enthalpies and Gibb's free energies (including ZPE) of all the species	63
4(Section 4.1)	1	Optimization of reaction condition for catalyst, Oxidant	11
	2	Screening of the reaction for the amount of catalyst and oxidant in *ipso*-hydroxylation of phenylboronicacid	12
	3	Synthesis of phenol catalyzed by bio-silica	13
	4	Reusability of the catalyst in the synthesis of phenol	15
	5	A comparison study between "green-ness" among catalyst/reagents in the hydroxylation of phenylboronic acid to phenol	15
4(Section 4.2)	1	Optimization of reaction condition for catalyst, Oxidant	25
	2	Baker's yeast mediated synthesis of phenol from arylboronic acid	26
	3	Controlled reaction in favour of the proposed Mechanism	29
	4	Reusability of the catalyst	30