



	<p><b>3. Organic synthesis (any four experiments):</b></p> <p>a) Aliphatic electrophilic substitution: Preparation of iodoform from ethanol &amp; acetone.</p> <p>b) Aromatic electrophilic substitution (any one): Preparation of p-bromoacetanilide, bromination of acetophenone to phenacyl bromide, nitration of naphthalene to 1-nitronaphthalene, nitration of benzaldehyde to 3-nitrobenzaldehyde.</p> <p>c) Oxidation of: i) Benzoic acid from toluene ii) Cyclohexanone from cyclohexanol, iii) isoborneol to camphor using Jones reagent (any one).</p> <p>d) Reduction (any one): Reduction of o-nitroaniline to o-phenylenediamine using Sn/HCl; Reduction of p-nitro benzaldehyde to p-nitrobenzyl alcohol using NaBH<sub>4</sub></p> <p>e) Bromination of an alcohol using CBr<sub>4</sub>/ triphenylphosphine.</p> <p>f) Grignard reaction: Triphenylmethanol from benzoic acid ester or benzophenone. g) Aldol condensation: Dibenzal acetone from benzaldehyde</p> <p>h) Acetoacetic ester condensation : Preparation of ethyl n-butylacetoacetate or ethyl acetoacetate.</p> <p>i) Cannizzaro reaction using 4-chlorobenzaldehyde as substrate.</p> <p>j) Friedel Craft's reaction (any one): using toluene and succinic anhydride, resorcinol to resacetophenone, benzene and maleic anhydride to β-benzoylacrylic acid</p> <p>k) Solvent free preparation of coumarin by the Knoevenagel condensation under MW irradiation.</p> <p>l) Preparation of oxidizing agent (any one): Pyridinium chlorochromate-silica, pyridinium chlorochromate-alumina, MnO<sub>2</sub>.</p> <p>m) Preparation of cuprous chloride.</p> <p><b>3. Isolation from natural sources :</b> (any one) Caffeine from tea powder, piperine from pepper, cinnamaldehyde from cinnamon</p>	16 hr
<b>Pedagogy:</b>	Students should be given suitable pre- and post-lab assignments and explanation revising the theoretical aspects of laboratory experiments prior to the conduct of each experiment. Each of the experiments should be done individually by the students.	
<b>References / Readings</b>	<ol style="list-style-type: none"> <li>1. A.I. Vogel, A.R. Tatchell , B. S. Furniss, A.J. Hannaford, <i>Vogel's Textbook of Practical Organic Chemistry</i>, 5<sup>th</sup> Ed., Prentice Hall; 2011.</li> <li>2. D. Pasto, C. Johnson and M. Miller, <i>Experiments and Techniques in Organic Chemistry</i>, 1<sup>st</sup> Ed., Prentice Hall, 1991.</li> <li>3. L.F. Fieser, K.L. Williamson "Organic Experiments" 7th edition D. C. Heath, 1992.</li> <li>4. K.L. Williamson, K.M. Masters, <i>Macroscale and Microscale Organic</i></li> </ol>	

	<p><i>Experiments</i>, 6<sup>th</sup> Edition, Cengage Learning, 2010</p> <p>5. R.K. Bansal, <i>Laboratory Manual in Organic Chemistry</i>, New Age International, 5<sup>th</sup> Edition, 2016.</p> <p>6. S. Delvin, <i>Green Chemistry</i>, Sarup &amp; Sons, 2005.</p> <p>7. O.R. Rodig, C.E. Bell Jr. and A.K. Clark, <i>Organic Chemistry Laboratory Standard and Microscale Experiments</i>, Saunders College Publishing, 3<sup>rd</sup> edition, 2009.</p> <p>8. J. Mohan, <i>Organic Analytical Chemistry</i>, Narosa Publishing House, 2014.</p>	
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