Carbohydrate chemistry

Schedule:

Week 1: Occurrence and biological functions of carbohydrates.

Week 2: Classification and utility of carbohydrates.

Week 3: Constitution, configuration and conformation of monosaccharides, ways for their depiction.

Week 4: Basics of carbohydrate nomenclature.

Week 5: Structural properties of oligo- and polysaccharides. Microheterogenity.

Week 6: Application of physical methods of structural elucidation to carbohydrates (X-ray, UV-VIS, IR, MS, ORD/CD, NMR).

Week 7: Conformational analysis of monosaccharides. The anomeric effects (endo-, exo and reverse) and their explanation.

Week 8: Transformations of free sugars in aqueous media, their oxidation and reduction.

Week 9: Reactions of free sugars with alcohols, formation and hydrolysis of glycosides; reactions with N-, S-, and C-nucleophiles.

Week 10: Carbohydrate ethers and esters. Carbohydrate acetals and ketals.

Week 11: Formation and reactions of peracylated monosaccharides and glycosyl halides.

Week 12: Synthesis of glycosides with protected monosaccharide derivatives.

Week 13: Formation of unsaturated monosaccharide derivatives, creation of further carbonyl groups, reactions of the non-anomeric carbons, formation and cleavage of epoxides.