KUT 307/2 - Chemistry Practical VII (Inorganic and Analytical)

Course Objectives: 1) To acquire skills in synthesis, isolation and characterization of inorganic compounds.
2) To acquire skills in various analytical techniques including spectrophotometric titration, flame emission and atomic absorption spectrometry and gas chromatography.

Experiment title	Content	Number of laboratory hours	Expected outcome – upon completion of these experiments, the student should be able to:
Inorganic			
1.Organotin compounds: Formation of organotin adduct and outer sphere complexes by the reaction of Ph_2SnCl_2 with Schiff Bases.		6	• Synthesize organotin adduct and outer-sphere complexes. • Purify the products (adduct and complexes) by recrystallization. • Characterize the products (adduct and complexes) based on melting point and spectroscopic data (FT-IR and ^{1}H FT-NMR).
2. Synthesis of $[Co(CH_3)(DMG)_2Py]$.		6	• Synthesize organocobalt complex $[Co(CH_3)(DMG)_2Py]$ under inert atmosphere (N_2). • Isolate and dry the product (complex) under reduced pressure. • Characterize the complex based on melting point, elemental analysis (C & H) and spectroscopic data (FT-IR and ^{1}H FT-NMR).

Experiment title	Content	Number of laboratory hours	Expected outcome – upon completion of these experiments, the student should be able to:
3. Preparation and characterization of Ferrocene [bis(cyclopentadienyl)ferrum(II)]		6	• Distill (purify) starting material such as cyclopentadiene under inert atmosphere (N_2). • Synthesize organoiron complex, ferrocene. • Purify ferrocene via sublimation. • Characterize ferrocene based on elemental analysis (C & H) and spectroscopic data (UV, FT-IR and 1H FT-NMR).

Experiment title	Content	Number of laboratory hours	Expected outcome – upon completion of these experiments, the student should be able to:
Analytical			
1. Visible spectrophotometry	• Spectrophotometric Titrations	3	• Perform various photometric titrations.
2. Spectrofluorimetry:	• Determination of Pharmaceuticals (Acetylsalicylic (ASA) and Salicylic (SA) Acids) by Fluorometric Method	3	• Perform quantitative analysis using spectrofluorimetry.
3. Flame Emission Spectrometry:	• Flame Emission Spectrometric Determination of Sodium.	3	• Determine sodium using an internal standard method.
4. Atomic Absorption Spectrometry:	• Atomic absorption spectrometry	3	• Understand the effect of organic solvents and strong ligands in metal determination using atomic absorption spectrometry.
5. Gas chromatography	• Quantitative Gas Chromatographic Analysis of a Multi Component Mixture.	3	• Separate and determine the amount of volatile components (cyclohexane and ethylbenzene) using the internal standard gas chromatographic technique.
	TOTAL	**33**	