Summary of techniques, experiences and skills in Synthetic Chemistry Laboratory

Chem 260 Fall 2025

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| Experiment/tutorial | lab technique | instrumentation |
| E0: Introduction & luminescent lanthanides | Weighing in closed vesselVacuum filtration  | UV light/luminescence |
| T0: General concepts of spectroscopy |  | UV-vis spectroscopy |
| E1: Chemically active extraction | Separation of liquid mixtureVacuum and gravity filtrationRotary EvaporationRecrystallization | Melting range Thin layer chromatography  |
| T1: 1 H NMR |  |  |
| E2: The oxidation states of cobalt | Vacuum filtrationReflux | Magnetic susceptibility |
| T2: Interpretation of IR |  |  |
| E3: Synthesis and chemistry of alkenes | Simple Distillation Separation of a liquid mixture | Thin layer chromatographyGas chromatography interpretationIR spectroscopy |
| T3: 1H NMR of alkenes |  | 1H NMR interpretation |
| E4 & T4: Titanium | Vacuum filtrationVisible spectroscopy | Viewing X-ray crystallographic outputChemical drawing |
| E5: Isolation of a natural product | Column chromatographyPolarimetry | Tlc on fractionsOptical rotationNMR interpretation |
| T5: 13C{1H} and DEPT-135 NMR |  | NMR interpretation |
| E6 & T6: Copper carboxylates | Electrochemistry IR sample prep as KBr disks | IR spectroscopy |
| E7 & T7: Selective reduction | Reaction under refluxPurification by extractionRotary Evaporation  | Melting rangeIR spectroscopyProton NMR spectroscopy |
| E8: Vanadium tartrate complexes | Optical activity  | Polarimetry |
| T8: Processing NMR spectra |  | NMR analysis software |
| E9: The aldol reaction | UV/VIS spectroscopy | NMR interpretation |
| T9: Multinuclear NMR & spin-dilute systems |  | NMR interpretation |
| E10: Tin(IV) or tin (II). | Reflux in inert atmosphereRecrystallization | MS interpretationNMR interpretation of spin dilute example. |
| T10: Mass spectrometry |  | MS interpretation |
| E11: Synthesis and reactions of diazonium salts |  | mp |