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 vessel  Vacuum filtration | UV light/luminescence |
| T0: General concepts of spectroscopy |  | UV-vis spectroscopy |
| E1: Chemically active extraction | Separation of liquid mixture  Vacuum and gravity filtration  Rotary Evaporation  Recrystallization | Melting range  Thin layer chromatography |
| T1: 1 H NMR |  |  |
| E2: The oxidation states of cobalt | Vacuum filtration Reflux | Magnetic susceptibility |
| T2: Interpretation of IR |  |  |
| E3: Synthesis and chemistry of alkenes | Simple Distillation  Separation of a liquid mixture | Thin layer chromatography  Gas chromatography interpretation  IR spectroscopy |
| T3: 1H NMR of alkenes |  | 1H NMR interpretation |
| E4 & T4: Titanium | Vacuum filtration Visible spectroscopy | Viewing X-ray crystallographic output Chemical drawing |
| E5: Isolation of a natural product | Column chromatography  Polarimetry | Tlc on fractions  Optical rotation  NMR 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 reflux  Purification by extraction  Rotary Evaporation | Melting range  IR spectroscopy  Proton 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 atmosphere  Recrystallization | MS interpretation  NMR interpretation of spin dilute example. |
| T10: Mass spectrometry |  | MS interpretation |
| E11: Synthesis and reactions of diazonium salts |  | mp |