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Massachusetts Institute of Technology

Organic Chemistry 5.13

September 5, 2003
Prof. Timothy F. Jamison

Notes for Lecture #2

Organic Structure Determination: Infrared Spectroscopy (IR)

Molecules of the Day

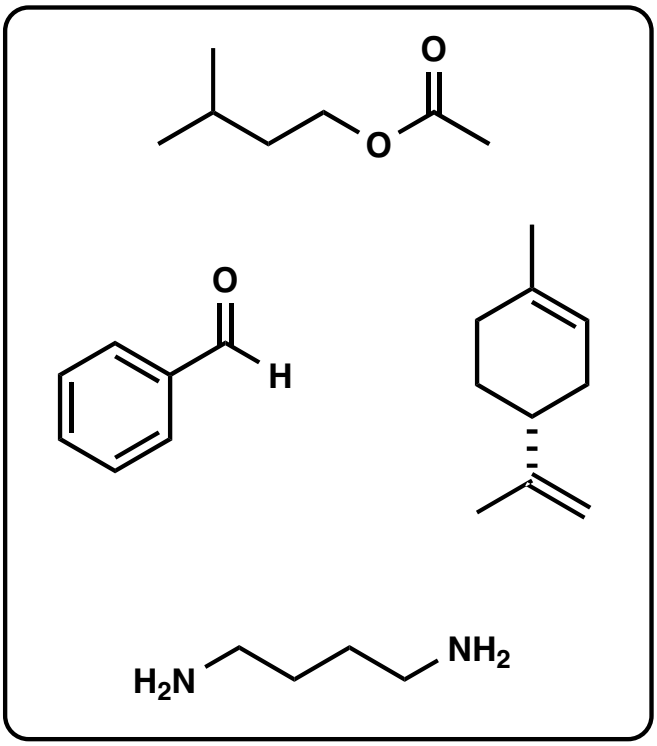
Isoamyl acetate – *banana*

Benzaldehyde – *almonds*

(R)–Limonene – *lemon, lime*

1,4-Diaminobutane – *a.k.a. putrescine*

Imagine that four unlabelled vials, each containing one of our four "Molecules of the Day", had somehow become mixed up. How could IR spectroscopy (instead of your sense of smell) be employed to identify the contents of each vial?



Three-Stage Strategy for Organic Structure Determination

- Determine the **molecular formula** using **elemental analysis** and **mass spectrometry**
- Identify the **functional groups** using **infrared spectroscopy** (IR) and **nuclear magnetic resonance spectroscopy** (NMR).
- Elucidate the **connectivity** using **^{1}H NMR** ("proton NMR") and **^{13}C NMR** ("carbon NMR") spectroscopy.