

November 02 2009

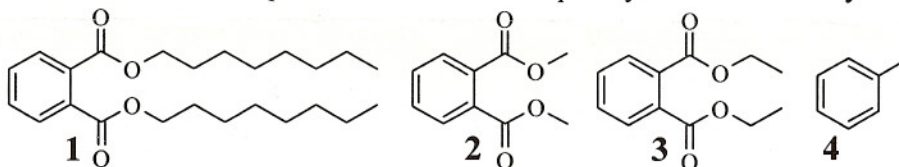
Examination questions.

- Give the examples of the stationary phases, eluents and analytes typically used in:
 - normal-phase liquid chromatography;
 - reversed-phase liquid chromatography;
 - ion-exchange liquid chromatography;
 - size-exclusion liquid chromatography.
- Give the definitions and/or formulas for retention time, adjusted retention time, relative retention, capacity factor.
- Propose a GC (gas chromatography) detector for:
 - analysis of volatile organic compounds (VOC);
 - analysis of halogenated compounds;
 - structural determination of an unknown compound.
 Explain your answer briefly.

4. A mixture of dioctyl phthalate **1**, dimethyl phthalate **2**, diethyl phthalate **3** and toluene **4** was separated using:

- gas chromatography on 100% dimethylpolysiloxane capillary column;
- gel permeation chromatography. *size-exclusion*

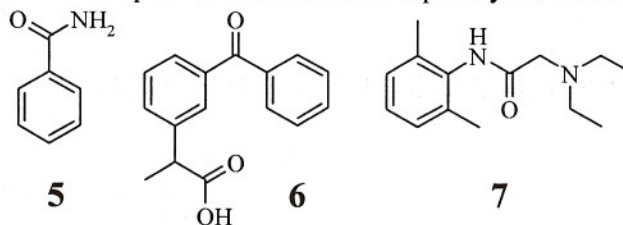
Estimate the elution order of the compounds in each case. Explain your answer briefly.



5. A mixture of benzamide **5**, ketoprofen **6**, and lidocaine **7** was separated using:

- reversed-phase column with Silica C18 at pH 3;
- reversed-phase column with Silica C18 at pH 10;
- normal-phase Silica column at neutral pH.

Estimate the elution order of the compounds in each case. Explain your answer briefly.



6. Draw schematically and briefly explain the principle of TOF mass analyzer. Give the definitions and/or formulas for mass resolution and mass accuracy and compare the typical values of resolution and accuracy of TOF and Quadrupole mass-spectrometers.

- thermal conductivity detector
- fire
-

∴ burned in air
 → form CH → CHO⁺
 → amount of C