

Separation science, chromatography (KDIT03)

tematika

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1. Extraction and chromatography methods in analytical chemistry. Liquid-liquid, liquid-solid, and gas-solid extraction methods. The history of chromatography.
2. Classification of chromatography. Principles of chromatography. Frontal, displacement, and elution chromatography. Retention data in chromatography. Plate theory.
3. Bandwidth. Resolution and possibilities for change.
4. Gas chromatography. Gas chromatography apparatus. Carrier gas system. Thermostat. Injectors, dispensers. Gas chromatography detectors.
5. Columns. Carriers. Separating liquids. Gas-solid and gas-liquid chromatography.
6. High-performance liquid chromatography (HPLC). The apparatus. Pumps. Liquid chromatography detectors. New trends in HPLC technology.
7. Normal and reversed phase liquid chromatography. Stationary phase. Mobile phase. Characterization of solvent strength and polarity. Gradient elution.
8. Ion chromatography. Direct and suppression techniques.
9. Capillary zone electrophoresis. Micellar electrokinetic chromatography. Capillary gel electrophoresis. Capillary isoelectric focusing. Capillary electrochromatography.
10. Qualitative and quantitative evaluation of chromatograms. Sample preparation. Pre-column and post-column derivatization methods. Designing experimental conditions. Method validation.
11. Coupled techniques: spectrometers connected to chromatographs.
12. GC-MS, HPLC-MS, CE-MS