Analysis No. 2:
Detection of food colorants in beverages with Column chromatography/thin layer chromatography

Analysis sample:
Lemonade or Sherbets

Tools and material:
Micro chromatography tube: approx.. 25x150 mm or 10x150 mm
Volumetric pipette, graduated pipette
Measuring cylinder
Volumetric flask
Beaker glass 50 mL, 100 mL
Platform balance
Glass stirrer
Glass capillary tube 1 µL or 5 µL
Thin layer chromatography material:
Silica gel 60 on aluminium or plastic material
Nanochromatography chamber 10 cm x10 cm or 20 cm x 10 cm

Chemicals
Ammonia 25 %
Ammonia 5 %
Methyl alcohol
n-Butyl alcohol
Ethyl alcohol
Glacial acetic acid
Potassium hydrogensulphate solution 5 %
Polyamide-powder (MN-Polyamid SC 6; Macherey&Nagel)
Glass wool
Sea sand
Elution solvent: Mixture from 5 parts by volume ammonia 5 % und 3 parts by volume methyl alcohol
Reference solutions: Solution of the reference substances 0.1 % in methyl alcohol or a mixture of methyl alcohol and water

Reference substances:
Tartrazine; indigo copper; erythrosine b; Carmine; Curcumin; cochenillic red; Brilliant blue

Mobile solvent for thin layer chromatography:
Mobile solvent: n-butyl alcohol/ ethyl alcohol /water /glacial acetic acid 60+10+20+0.5 (v/v)

Procedure:

Acidify 50 mL of the sample in a beaker glass with 5 mL of $KHSO_4$-solution. Mix the solution with 1 g of polyamide powder, then heat the blend to boiling temperature and let it rest for 2 minutes.

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The colorants will draw up the polyamide. Interfering additional substances are removed with the column method: fill the suspension of the tinged polyamide powder in a micro chromatography tube that has before been sealed with glass wool and sea sand. The so created column of polyamide powder including the adsorbed colorants must initially be washed with 100 mL of hot, distilled water to remove interfering substances. To remove the water add 5 mL of methyl alcohol on top of the column. Close the tap when an intensely colored solution appears at the end of the column. Reject all eluates that has been obtained to this point
Now eluate the colorants with the elution solvent (10 – 30 mL required) from the column in a dry and clean beaker glass. Eluate until the column is almost colorless. The so obtained solution is carefully concentrated to 1-2- mL and then used for the thin layer chromatography.

Evaluation:

Identify the colorants in the analysis sample by color and Rf-Data of the components of sample and reference substance. The chromatogram will be scanned and imbedded (jpg - image file) to the report.

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