

Phthalate esters, plasticizers

Application Note

Materials Testing & Research

Authors

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Introduction

Phthalate esters in products such as PVC can be extracted with dichloromethane and analyzed with a non-polar capillary column. Identification of the released phthalates can be done by comparing retention times of sample peaks and standards, as well as standard addition. Calibration range for phthalates in toys is 0.002 - 0.2% per compound, Relative RSD of the method is below 0.5%. Detection limits are around 5 ppm.



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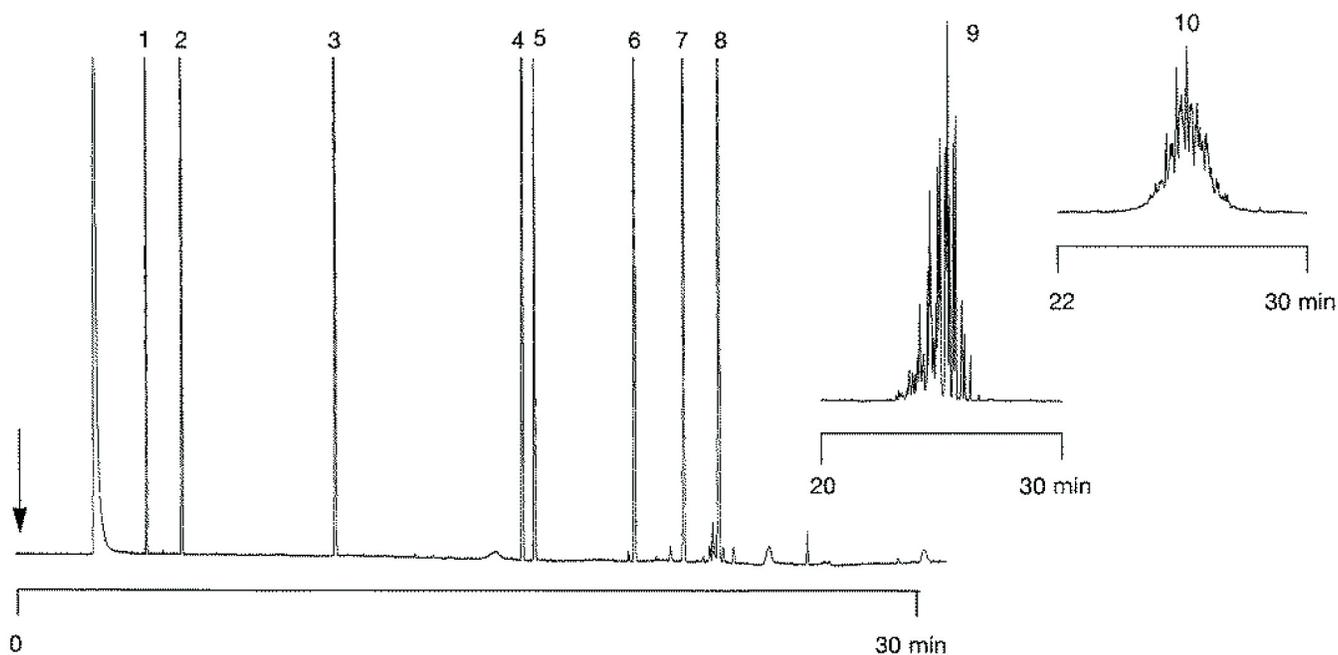
Conditions

Technique : GC-capillary
Column : Agilent CP-Sil 5 CB, 0.32 mm x 50 m fused silica
WCOT (df = 0.12 µm) (Part no. CP7750)
Temperature : 150 °C → 280 °C, 5 °C/min;
280 °C (5 min)
Carrier Gas : He, 130 kPa (1.3 bar, 19.5 psi)
Injector : Splitter/Splitless,
splitflow 55 mL/min, T = 300 °C
Detector : FID, T = 300 °C
Sample Size : 1.0 µL
Concentration Range : 120 ppm each
Solvent Sample : dichloromethane

Courtesy : Suresh C. Rastogi,
National Environmental Research Inst.,
Roskilde, Denmark

Peak identification

1. dimethyl phthalate (DMP)
2. diethyl phthalate (DEP)
3. dibutyl phthalate (DBP)
4. butyl benzyl phthalate (BBP)
5. butyl octyl phthalate (BOP)
6. bis(2-ethylhexyl) phthalate (DEHP)
7. dinonyl phthalate (DNNP)
8. dioctyl phthalate (DNOP)
9. diisononyl phthalate (DINP)
10. diisodecyl phthalate (DIDP)



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