Übungen zur Experimentalvorlesung „Organische Chemie“ SoS 2005

Lösungen zu Blatt 1

1.) Kristallisation (unterschiedliche Löslichkeitsprodukte in versch. Lösungsmitteln
Destillation (unterschiedliche Siedetemperaturen)
Dünnschicht-, Säulen-, Gaschromatographie (unterschiedliches Adsorptionsvermögen auf der stationären Phase)
Filtration (unterschiedliche Molekülgrößen)
Elektrophorese (Ladung, Wanderungsgeschwindigkeit der Ladungsträger)

2.) $R_f = \frac{d(\text{Start} - \text{Produkt})}{d(\text{Start - Ende})}$

R_f-Werte: 0.14, 0.28, 0.86

R_f äbhangig von: Laufmittelpolarität, Material der stationären Phase, Produktpolarität (bzw. Absorptionsvermögen an die stationäre Phase)

3.) a.) $(CH)_n$
b.) $(C_4H_5N)_n$
c.) $(C_8H_9NO)_n$

4.)

$$C_xH_yO_z \longrightarrow x\,CO_2 + y/2\,H_2O$$

147 mg 60.3 mg

*12/44 *2/18

m_c=40 mg C m_h=6.7 mg H

$m_c + m_h$= 46.7 mg $\Longrightarrow$ m_o= 100 mg - 46.7 mg = 53.3 mg O

40 mg C : 12 = 3.3
53.3 mg O : 16 = 3.3 $\Longrightarrow$ $(CH_2O)_n$ $\Longrightarrow$ $C_6H_{12}O_6$
6.7 mg H : 2 = 6.7

5.)

$C_xH_y \longrightarrow x\ CO_2 + y/2\ H_2O$

20.47 mg 8.36 mg

↓ ↓

0.47 mmol 0.46mmol

⇓

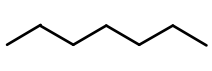
x=1 y=2 ⟹ C_nH_{2n}

p*V = n*R*T und M=m/n

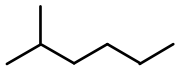
M = (m*R*T)/(p*V) ⟹ M = 84.0 g/mol ⟹ n = 6 ⟹ C_6H_{12}

6.) siehe Lehrbuch

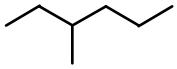
7.) 9 Konstitutionsisomere:



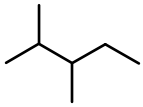
n-Heptan



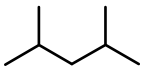
2-Methylhexan



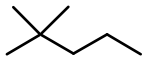
3-Methylhexan



2,3-Dimethylpentan

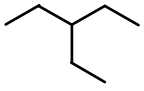


2,4-Dimethylpentan

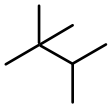


2,2-Dimethylpentan

3,3-Dimethylpentan



3-Ethylpentan



2,2,3-Trimethylbutan