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ABSTRACT

Enthalpies of solution at infinite dilution at 298 K, $\Delta_{soln}H^{A/Solvent}$, have been measured by isothermal solution calorimetry for 43 and 72 organic solutes dissolved in chlorobenzene and 1,2-dichlorobenzene, respectively. The measured $\Delta_{soln}H^{A/Solvent}$ data, along with published $\Delta_{soln}H^{A/Solvent}$ values taken from the published literature for solutes dissolved in both chlorobenzene solvents, were converted to enthalpies of solvation, $\Delta_{solv}H^{A/Solvent}$, using standard thermodynamic equations. Abraham model correlations were developed from the experimental $\Delta_{solv}H^{A/Solvent}$ data. The best derived correlations describe the experimental gas-to-chlorobenzene and gas-to-1,2-dichlorobenzene enthalpies of solvation to within standard deviations of 1.5 kJ mol⁻¹ and 1.9 kJ mol⁻¹, respectively. Enthalpies of X—H... π (X – O, N, and C) hydrogen bond formation of proton donor solutes (alcohols, amines, chlorinated hydrocarbons, *etc.*) with chlorobenzene and 1,2-dichlorobenzene were calculated based on the Abraham solvation equation. Obtained values are in good agreement with the results determined using conventional methods.

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1. Introduction

This study continues our combined experimental and theoretical examination of gas-to-organic solvent transfer processes for nonelectrolyte solutes [1–19]. Such processes govern chemical separations by gas-liquid chromatography, measurement of solubilities and activity coefficients by inert-gas stripping methods, and the removal and pre-concentration of volatile organic solutes from aqueous analytical samples using headspace single drop microextraction methods. The latter extraction process involves two partition coefficients, the first for solute transfer to the gas phase from the aqueous solution being analyzed, and the second for solute transfer into the suspended liquid drop of the micro-extraction device. A complete understanding of the solute transfer process requires not only examining how the equilibrium partition coefficient depends on the polarity and hydrogen-bonding character of the solute and solvent molecules, but also on understanding the enthalpic effects that determine how the gas-to-organic solvent

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http://dx.doi.org/10.1016/j.tca.2015.08.015 0040-6031/© 2015 Elsevier B.V. All rights reserved. partition coefficients of the different solute-solvent combinations vary with temperature.

In previous publications [1–15] we have developed Abraham model correlations:

$$\Delta_{\text{solv}} H^{\text{A/Solvent}} = c_{\text{h},1} + e_{\text{h},1} \cdot \mathbf{E} + s_{\text{h},1} \cdot \mathbf{S} + a_{\text{h},1} \cdot \mathbf{A} + b_{\text{h},1} \cdot \mathbf{B} + l_{\text{h},1} \cdot \mathbf{L}$$
(1)

$$\Delta_{\text{solv}} H^{\text{A/Solvent}} = c_{\text{h},\nu} + e_{\text{h},\nu} \cdot \mathbf{E} + s_{\text{h},\nu} \cdot \mathbf{S} + a_{\text{h},\nu} \cdot \mathbf{A} + b_{\text{h},\nu} \cdot \mathbf{B} + \nu_{\text{h},\nu} \cdot \mathbf{V}$$
(2)

for mathematically describing experimental enthalpies of solvation, $\Delta_{solv} H^{A/Solvent}$, of inert gases and organic vapors dissolved in water and in a wide range of organic solvents of varying polarity and hydrogen bonding character. The organic solvents included several saturated hydrocarbons [1,2] and aromatic hydrocarbons [1,3,4], chlorinated alkanes [4–6], several primary, secondary and tertiary alcohols [7–11], two dialkyl carbonates [12], one alkyl acetate solvent [13], one dialkyl ether [13] and two cyclic ethers [6,8], as well as several miscellaneous organic solvents [9,14,15]. In each case Eqs. (1) and (2) were found to provide a reasonably accurate mathematical description of the experimental enthalpy of solvation





Table 1

Characteristics of the chemicals studied in this work.

| Instance Instance Instance Instance Instance Instance Instance Actemin (1) Signa Adrich 0.59 Direllation 0.598 C.C. 0.0002 Actemin (1) Signa Adrich 0.58 Direllation 0.598 C.C. 0.0003 Antiler (1) Signa Adrich 0.59 Direllation 0.598 C.C. 0.0003 Antiler (1) Signa Adrich 0.59 Nore - <th>Chemical name</th> <th>Source</th> <th>Initial mass</th> <th>Purification</th> <th>Final mass</th> <th>Analysis</th> <th>Mass fraction</th> | Chemical name | Source | Initial mass | Purification | Final mass | Analysis | Mass fraction |
|---|-----------------------------------|-----------------------|-----------------|-------------------|-----------------|----------|---------------|
| Acctors (1) Signa Aldrich 0.99 Disiliation 0.997 C.C. 0.0002 Actrsphone (1) Signa Aldrich 0.99 Disellation 0.997 C.C. 0.0002 Actrsphone (1) Signa Aldrich 0.99 Disellation 0.998 C.C. 0.0002 Antilazor (1) Signa Aldrich 0.99 None - - - Brazoattrike (1) Signa Aldrich 0.99 None - - - - Brazoattrike (1) Signa Aldrich 0.98 Distillation 0.995 C.C. 0.0002 Brazoattrike (1) Signa Aldrich 0.98 Distillation 0.996 C.C. 0.0002 Brazoattrike (1) Signa Aldrich 0.98 Distillation 0.997 C.C. 0.0002 Brazoattrike (1) Signa Aldrich 0.98 Distillation 0.987 C.C. 0.0002 Brazoattrike (1) Signa Aldrich 0.98 Distillation 0.987 C.C. 0.0002 Brazoattr | | | fraction purity | method | fraction purity | method | of water |
| Action(1) Signa Addich 0.88 Diallation 0.885 C.C. 0.0002 Action(1) Signa Addich 0.98 Diallation 0.986 C.C. 0.0003 Autilace(1) Signa Addich 0.99 Diallation 0.998 C.C. 0.0003 Autilace(1) Signa Addich 0.99 None - - - Brazzatipitation(1) Signa Addich 0.98 Diallation 0.986 C.C. 0.0002 Brazzatipitation(1) Signa Addich 0.98 Diallation 0.986 C.C. 0.0002 Batta-Fold(1) Signa Addich 0.98 Diallation 0.986 C.C. 0.0002 Batta-Fold(1) Signa Addich 0.98 Diallation 0.997 C.C. 0.0002 Batta-Fold(1) Signa Addich 0.985 None - - - - - - - - - - - - - - - - - - - | Acetonitrile (1) | Sigma Aldrich | 0.99 | Distillation | 0.998 | GC | 0.0002 |
| Acting (1) Signa Additch 0.88 Disillation 0.896 CC 0.0003 Autiona (1) Signa Additch 0.99 None 0.997 0.0003 Autiona (1) Signa Additch 0.99 None 0.997 0.0002 Berzontinie (1) Signa Additch 0.99 None - - - Berzontinie (1) Signa Additch 0.99 None - - - Battanor (1) Signa Additch 0.99 None - - - - Butan 1-61(1) Signa Additch 0.98 Distillation 0.995 CC 0.0002 Butan 1-61(1) Signa Additch 0.98 Distillation 0.995 CC 0.0002 Chrobobarane (1) Signa Additch 0.99 Distillation 0.995 CC 0.0002 Chrobobarane (1) Signa Additch 0.99 Distillation 0.995 CC 0.0001 Chrobobarane (1) Signa Additch 0.98 Distillation | Acetone (1) | Sigma Aldrich | 0.99 | Distillation | 0.997 | GC | 0.0002 |
| Anisol (1) Signa Admin 0.98 Desilution 0.985 CC 0.0001 Berzontric (1) Signa Admin 0.99 Distillation 0.999 CC 0.0002 Berzontric (1) Signa Admin 0.99 None - - - Biphergy (2) Signa Admin 0.99 None - - - Biphergy (2) Signa Admin 0.99 None - - - Biphergy (2) Signa Admin 0.99 Distillation 0.997 CC 0.0001 Bury actar (1) Signa Admin 0.99 Distillation 0.997 CC 0.0002 Bury actar (1) Signa Admin 0.99 Distillation 0.995 CC 0.0002 Columprecision (1) Signa Admin 0.99 Distillation 0.995 CC 0.0002 Columprecision (1) Signa Admin 0.98 Distillation 0.995 CC 0.0002 Columprecision (1) Signa Admin 0.98 Dist | Acetophenone (l) | Sigma Aldrich | 0.98 | Distillation | 0.996 | GC | 0.0005 |
| Antine (1) Sigma Addich 0.99 Direllation 0.988 CC 0.0002 Beruspierone (r) Sigma Addich 0.99 None - - - - Beruspierone (r) Sigma Addich 0.99 None - - - - Beruspierone (r) Sigma Addich 0.99 None - - - - Beruspierone (r) Sigma Addich 0.98 Diriellation 0.996 CC 0.0002 Bury barcates (T) Sigma Addich 0.98 Diriellation 0.998 CC 0.0002 Bury barcates (T) Sigma Addich 0.995 Nine - - - - 1-Choroburane (T) Sigma Addich 0.995 Nine - <td>Anisole (1)</td> <td>Sigma Aldrich</td> <td>0.98</td> <td>Distillation</td> <td>0.996</td> <td>GC</td> <td>0.0003</td> | Anisole (1) | Sigma Aldrich | 0.98 | Distillation | 0.996 | GC | 0.0003 |
| Additactic (r) Sigma Addition 0.99 None - | Aniline (1) | Sigma Aldrich | 0.99 | Distillation | 0.998 | GC | 0.0003 |
| Barbannini (I) Sigma Additi. Disk Disk Disk Disk Disk Disk Disk Bromobergene (I) Sigma Additi. 0.98 Disk 0.995 CC 0.0002 Bromobergene (I) Sigma Additi. 0.99 Disk 0.995 CC 0.0002 Branne (I) Sigma Additi. 0.99 Disk 0.997 CC 0.0002 Branne (I) Sigma Additi. 0.99 Disk 0.997 CC 0.0002 Buty-normite (I) Sigma Additi. 0.99 Disk 0.997 CC 0.0002 Buty-normite (I) Sigma Additi. 0.98 Disk 0.997 CC 0.0002 Buty-normite (I) Sigma Additi. 0.98 Disk 0.995 CC 0.0004 Sigma Additi. 0.98 Disk Disk 0.995 CC 0.0001 L2. Disk programme (I) Sigma Additi. 0.98 Disk Disk 0.995 CC 0.0001 L2. Disk programma Additi. </td <td>Anthracene (cr)</td> <td>Sigma Aldrich</td> <td>0.99</td> <td>None</td> <td>-</td> <td>-</td> <td>-</td> | Anthracene (cr) | Sigma Aldrich | 0.99 | None | - | - | - |
| Balance (c) Display Addr.h Oldy Nume - - - - Butanoch() Sigma Addr.h 0.98 Distillation 0.996 GC 0.0002 Butanoch() Sigma Addr.h 0.98 Distillation 0.996 GC 0.0002 Buty henzate() Sigma Addr.h 0.98 Distillation 0.998 CC 0.0002 Buty henzate() Sigma Addr.h 0.98 Distillation 0.998 CC 0.0002 Chinorberzere (I) Sigma Addr.h 0.98 Distillation 0.995 CC 0.0002 Chinorberzere (I) Sigma Addr.h 0.98 None - - - - Decan-I (I) Sigma Addr.h 0.98 None - | Benzonitrile (I) | Sigma Aldrich | 0.98 | Distillation | 0.999 | GC | 0.0002 |
| Brandard (Col) Spins Addreh Doll Disclination n 9886 CC n 0001 Batanane (1) Sigma Addreh 0.98 Disclination 0.997 GC 0.0002 Batanane (1) Sigma Addreh 0.98 Disclination 0.997 GC 0.0002 Batyl actatz (1) Sigma Addreh 0.98 Disclination 0.997 GC 0.0002 Batyl actatz (1) Sigma Addreh 0.98 Disclination 0.995 CC 0.0002 2-Charophenol (1) Sigma Addreh 0.98 Disclination 0.995 CC 0.0004 2-Charophenol (1) Sigma Addreh 0.98 Disclination 0.995 CC 0.0004 2-charophenol (1) Sigma Addreh 0.98 Disclination 0.995 CC 0.0001 2-charophenol (1) Sigma Addreh 0.98 Disclination 0.995 CC 0.0001 1/-Disclose (1) Sigma Addreh 0.98 Disclination 0.995 CC 0.0002 1/-Disclo | Benzophenone (Cr) | Sigma Aldrich | 0.99 | None | - | - | - |
| Instan-rei (I) Sigma Addrich 0.38 Discillation 0.996 CC 0.0002 Butylac-rei (I) Sigma Addrich 0.39 Discillation 0.998 CC 0.0003 Butyl benzyate (I) Sigma Addrich 0.39 Discillation 0.997 CC 0.0002 Butyl benzyate (I) Sigma Addrich 0.38 Discillation 0.997 CC 0.0002 Butyn benzyate (I) Sigma Addrich 0.38 Discillation 0.997 CC 0.0002 IControll Sigma Addrich 0.38 Discillation 0.996 CC 0.0002 IScane (I) Sigma Addrich 0.38 Discillation 0.995 CC 0.0001 Ibetryn (I) Sigma Addrich 0.38 Discillation 0.995 CC 0.0001 Ibetryn (I) Sigma Addrich 0.38 Discillation 0.997 CC 0.0001 Ibetryn (I) Sigma Addrich 0.38 Discillation 0.997 CC 0.0001 Ibetry | Bipliellyl (Cl) | Sigma Aldrich | 0.99 | Distillation | - | - | - |
| bitalitation 0.397 C2 0.0004 Burly Acctat (1) Sigma Adrich 0.93 Distillation 0.996 C2 0.0002 Burly Acctat (1) Sigma Adrich 0.98 Distillation 0.996 C2 0.0002 Chicrobancet (1) Sigma Adrich 2.985 None - | Butanone (1) | Sigma Aldrich | 0.98 | Distillation | 0.990 | GC | 0.0003 |
| Baryl Decaster (r) Sigma Adirch 0.38 Distillation 0.998 GC 0.0002 Buryl Decaster (r) Sigma Adirch 0.99 Distillation 0.997 GC 0.0002 Buryn Decaster (r) Sigma Adirch 0.93 Distillation 0.997 GC 0.0002 1-Chiorobenzene (r) Sigma Adirch 0.936 Distillation 0.995 CC 0.0002 2-Abrorphicon (r) Sigma Adirch 0.989 Distillation 0.995 CC 0.0001 Discholy effect Sigma Adirch 0.989 Distillation 0.995 CC 0.0001 1.2. Dichioropenzene (r) Sigma Adirch 0.988 Distillation 0.995 CC 0.0001 1.2. Dichioropenzene (r) Sigma Adirch 0.988 Distillation 0.997 CC 0.0001 1.2. Dichioropenzene (r) Sigma Adirch 0.981 Distillation 0.997 CC 0.0002 2. Distriburg effect Sigma Adirch 0.981 Distillation 0.997 CC 0. | Butan-1-ol (1) | Sigma Aldrich | 0.99 | Distillation | 0.997 | GC | 0.0002 |
| Bury Decame (1) Sigma Addrich 0.99 Desililation 0.996 CC 0.0002 Chloroberzene (1) Sigma Addrich 20.985 None | Butyl acetate (1) | Sigma Aldrich | 0.98 | Distillation | 0.998 | GC | 0.0003 |
| Burghornine (1) Sigma Addrich 0.98 Disillation 0.997 CC 0.0002 1-Chorobetane (1) Sigma Addrich 0.98 Disillation 0.995 CC 0.0004 2-Choropheno (1) Sigma Addrich 0.98 Disillation 0.955 CC 0.0004 <i>n</i> -becan: 1-ol (1) Sigma Addrich 0.98 Disillation 0.955 CC 0.0004 12-Dichloropropane (1) Sigma Addrich 0.98 Disillation 0.995 CC 0.0001 12-Dichloropropane (1) Sigma Addrich 0.98 Disillation 0.995 CC 0.0002 12-Dichloropropane (1) Sigma Addrich 0.99 None - - - 12-Dichloropropane (1) Sigma Addrich 0.99 Disillation 0.996 CC 0.0002 2.6-Direphonybene (C1) Sigma Addrich 0.98 Disillation 0.998 CC 0.0002 2.6-Direphonybene (C1) Sigma Addrich 0.98 Disillation 0.998 CC 0.0002 | Butyl benzoate (1) | Sigma Aldrich | 0.99 | Distillation | 0.996 | GC | 0.0002 |
| Chlorobarsene (I) Sigma Addrich 9.98 Disiliation 9.95 C. 0.004 2-chlorophenol (I) Sigma Addrich 0.98 Disiliation 0.995 CC 0.0002 2-chlorophenol (I) Sigma Addrich 0.38 Disellation 0.995 CC 0.0004 br-havier dentri (I) Sigma Addrich 0.38 Disellation 0.995 CC 0.0004 12-bichloropropane (I) Sigma Addrich 0.38 Disellation 0.995 CC 0.0002 12-bichloropropane (I) Sigma Addrich 0.38 Disellation 0.995 CC 0.0002 12-bichloropropane (I) Sigma Addrich 0.38 Disellation 0.995 CC 0.0002 Dichloromethane (I) Sigma Addrich 0.39 Disellation 0.997 CC 0.0002 Dichloromethane (I) Sigma Addrich 0.38 Disellation 0.397 CC 0.0002 Dichloromethane (I) Sigma Addrich 0.38 Disellation 0.397 CC 0.0002 | Butyronitrile (l) | Sigma Aldrich | 0.98 | Distillation | 0.997 | GC | 0.0002 |
| i-Chlorophatare (1) Sigma Addrich 0.98 Dicillation 0.995 CC 0.0002 <i>n</i> -Decran (1) Sigma Addrich 0.99 None - | Chlorobenzene (1) | Sigma Aldrich | ≥0.995 | None | - | - | - |
| 2-Chiorophenol (1) Signa Aldrich 0.98 Distillation 0.995 GC 0.0002 becan-1-01 (1) Signa Aldrich 0.98 Distillation 0.965 GC 0.0001 becan-1-01 (1) Signa Aldrich 0.98 Distillation 0.995 GC 0.0001 12-bichtorbenzene (1) Signa Aldrich 0.99 None - - 0.0003 12-bichtorbenzene (1) Signa Aldrich 0.99 None - - 0.0003 n-Docaca (1) Signa Aldrich 0.99 None - - - Dichtoronethane (1) Signa Aldrich 0.99 None - - - 2-binerboxythenol (2) Signa Aldrich 0.99 None - - - 2-binerboxythenol (2) Signa Aldrich 0.99 None - - - - Av-Dinethythormande (1) Signa Aldrich 0.98 Distillation 0.995 CC 0.0002 Ethano 2010 Signa Aldrich | 1-Chlorobutane (l) | Sigma Aldrich | 0.98 | Distillation | 0.995 | GC | 0.0004 |
| n-Decand-off () Signa Adrich 0.99 None – – – – – – – – – – – – – – – – – – – | 2-Chlorophenol (1) | Sigma Aldrich | 0.98 | Distillation | 0.996 | GC | 0.0002 |
| Decan-1-01(1) Signa Addrich 0.98 Diciliation 0.995 CC 0.0001 1.2-Dichloropenzent (1) Signa Addrich 0.935 None - - - - 1.2-Dichloropenzent (1) Signa Addrich 0.38 Distiliation 0.995 CC 0.0003 1.4-Dichloropenzent (1) Signa Addrich 0.39 Neuron - - - - 2.5-Dinchloropenzent (1) Signa Addrich 0.39 Neuron 0.995 CC 0.0001 2.5-Dinchloropenzent (1) Signa Addrich 0.98 Dictiliation 0.997 CC 0.0002 N.N-Dimethylocetamide (1) Signa Addrich 0.98 Dictiliation 0.997 CC 0.0002 Ethyl acte (1) Signa Addrich 0.98 Distiliation 0.997 CC 0.0002 Ethyl acte (1) Signa Addrich 0.98 Distiliation 0.997 CC 0.0002 Ethyl acte (1) Signa Addrich 0.98 Distiliation 0.995 CC 0 | n-Decane (l) | Sigma Aldrich | 0.99 | None | - | - | - |
| Der-Bruty ether (1) Signa Aldrich 0.38 Distiliation 0.396 C.C. 0.0001 1.2-Dichloropropane (1) Signa Aldrich 0.38 Distiliation 0.995 C.C. 0.0003 1.2-Dichloropropane (1) Signa Aldrich 0.39 Distiliation 0.995 C.C. 0.0003 Dichformerthane (1) Signa Aldrich 0.39 Distiliation 0.997 C.C. 0.0001 2.6-Dimethoxyphenol (cr) Signa Aldrich 0.98 Distiliation 0.997 C.C. 0.0002 2.6-Dimethoxyphenol (cr) Signa Aldrich 0.98 Distiliation 0.997 C.C. 0.0004 N.A-Dimethydicaranide (1) Signa Aldrich 0.98 Distiliation 0.995 C.C. 0.0002 Ethyla excate (1) Signa Aldrich 0.98 Distiliation 0.996 C.C. 0.0002 Ethyl sexcate (1) Signa Aldrich 0.98 Distiliation 0.996 C.C. 0.0002 Ethyl sexcate (1) Signa Aldrich 0.98 Distiliation 0.997 | Decan-1-ol (l) | Sigma Aldrich | 0.98 | Distillation | 0.995 | GC | 0.0004 |
| L2-Bichlorophysic Signa Addrich 20:995 Nole - | Di- <i>n</i> -butyl ether (1) | Sigma Aldrich | 0.98 | Distillation | 0.996 | GC | 0.0001 |
| L2-JERUMENTPROPARE (L) Sigma Addrich 0.98 Distiliation 0.995 C.C 0.0003 n-Docksane (I) Sigma Addrich 0.99 None - | 1,2-Dichlorobenzene (I) | Sigma Aldrich | ≥0.995 | None | - | - | - |
| JA-BADGKABE (1) Signa Addicità 0.28 Distituzione 0.295 C.C 0.0003 Deblormenthar (1) Signa Addicità 0.39 Distituzione 0.396 C.C 0.0001 Deblormenthar (1) Signa Addicità 0.39 Distituzione 0.398 C.C 0.0001 2.6-Dimentiony personalità 0.39 Distituzione 0.398 C.C 0.0002 2.6-Dimentiony personalità 0.39 Distituzione 0.397 C.C 0.0002 Al-Dimentiony personalità Signa Addicità 0.98 Distituzione 0.397 C.C 0.0002 Al-Dimentiony personalità Signa Addicità 0.98 Distituatione 0.996 C.C 0.0003 Plus Discritati (1) Signa Addicità 0.98 Distituatione 0.996 C.C 0.0003 Plus Discritati (1) Signa Addicità 0.98 Distituation 0.996 C.C 0.0002 Plus Discritati (1) Signa Addicità 0.98 Distituation 0.996 C.C 0.0002 | 1,2-Dichloropropane (1) | Sigma Aldrich | 0.98 | Distillation | 0.995 | GC | 0.0003 |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | n Dodocano (1) | Sigma Aldrich | 0.98 | Nono | 0.995 | GC | 0.0005 |
| Diethyl ether (1) Eks 0.93 Distillation 0.97 CC 0.0001 24-Dimethylactamide (1) Signa Aldrich 0.97 Distillation 0.997 CC 0.0002 NA-Dimethylactamide (1) Signa Aldrich 0.98 Distillation 0.997 CC 0.0002 Phane (1) Signa Aldrich 0.98 Distillation 0.997 CC 0.0002 Ethyl actar(1) Signa Aldrich 0.98 Distillation 0.996 CC 0.0002 Ethyl salcytat(1) Signa Aldrich 0.98 Distillation 0.996 CC 0.0002 Fluoroberzene (1) Signa Aldrich 0.99 None - - - -Heyna -1-0(1) Signa Aldrich 0.98 Distillation 0.997 CC 0.0002 -Heyna -1-0(1) Signa Aldrich 0.98 Distillation 0.997 CC 0.0003 Jadde (cr) Signa Aldrich 0.98 Distillation 0.997 CC 0.0002 -Heyna -1-0(1) | Dichloromethane (1) | Sigma Aldrich | 0.99 | Distillation | - 0.996 | - | - 0.002 |
| 2.6-Dimension/phenol (cr) Sigma Addich 0.97 Subilization 0.98 CC 0.0004 NA-Dimethylformamide (1) Sigma Addich 0.98 Distillation 0.997 CC 0.0002 NA-Dimethylformamide (1) Sigma Addich 0.98 Distillation 0.997 CC 0.0002 Ethyl sectare (1) Sigma Addich 0.98 Distillation 0.996 CC 0.0002 Ethyl sectare (1) Sigma Addich 0.98 Distillation 0.996 CC 0.0002 Plarobezone (1) Sigma Addich 0.99 None - - - Herbarae (1) Sigma Addich 0.99 None - - - - Herbarae (1) Sigma Addich 0.99 None - - - - - - - - - - - - - - - - - 0.002 - - - 0.003 - - - - <td< td=""><td>Diethyl ether (1)</td><td>Ekos</td><td>0.98</td><td>Distillation</td><td>0.997</td><td>GC</td><td>0.0002</td></td<> | Diethyl ether (1) | Ekos | 0.98 | Distillation | 0.997 | GC | 0.0002 |
| N.P.Dimethylisetamide (I) Sigma Aldrich 0.98 Distillation 0.997 GC 0.0002 Ethanol (I) Sigma Aldrich 0.98 Distillation 0.997 GC 0.0002 Ethanol (I) Sigma Aldrich 0.98 Distillation 0.995 GC 0.0002 Ethyl salicylate (I) Sigma Aldrich 0.98 Distillation 0.995 GC 0.0002 Ethyl salicylate (I) Sigma Aldrich 0.98 Distillation 0.996 GC 0.0002 n'heptane (I) Sigma Aldrich 0.98 None - - - - Heptane 2-one (I) Sigma Aldrich 0.98 None - | 2.6-Dimethoxyphenol (cr) | Sigma Aldrich | 0.97 | Sublimation | 0.998 | GC | 0.0004 |
| N/A-Dimethylformanide(i) Signa Aldrich 0.98 Distillation 0.997 CC 0.0002 Ethanol (n) Signa Aldrich 0.98 Distillation 0.995 CC 0.0002 Ethyl berzoare (n) Signa Aldrich 0.98 Distillation 0.995 CC 0.0002 Ethyl salcylate (n) Signa Aldrich 0.98 Distillation 0.996 CC 0.0002 Pilkorobenzene (n) Signa Aldrich 0.99 None - - - Heptan-2-one (n) Signa Aldrich 0.99 None - - - Heytan-2-one (n) Signa Aldrich 0.98 Distillation 0.997 CC 0.0003 2-Hydroxyacctophenone (n) Signa Aldrich 0.98 Distillation 0.996 CC 0.0004 2-Methoxyphenol (n) Signa Aldrich 0.98 Distillation 0.997 CC 0.0002 2-Methoxyphenol (n) Signa Aldrich 0.97 Distillation 0.997 CC 0.0002 2-Me | <i>N.N</i> -Dimethylacetamide (1) | Sigma Aldrich | 0.98 | Distillation | 0.997 | GC | 0.0002 |
| Ethan (1) Signa Aldrich 0.98 Distillation 0.996 CC 0.0004 Ethyl acetate (1) Signa Aldrich 0.98 Distillation 0.995 CC 0.0002 Ethyl salicylate (1) Signa Aldrich 0.98 Distillation 0.996 CC 0.0002 Fluorobenzene (1) Signa Aldrich 0.99 Distillation 0.997 CC 0.0002 r-Heptane (1) Signa Aldrich 0.98 Distillation 0.997 CC 0.0002 r-Heptane (1) Signa Aldrich 0.98 Distillation 0.997 CC 0.0003 2-Hydroxyacetophenone (1) Signa Aldrich 0.98 Distillation 0.997 CC 0.0004 2-Hydroxyacetophenon (1) Signa Aldrich 0.98 Distillation 0.997 CC 0.0002 2-Methoxyphenol (1) Signa Aldrich 0.98 Distillation 0.997 CC 0.0002 2-Methoxyphenol (1) Signa Aldrich 0.99 None - - - | N,N-Dimethylformamide (1) | Sigma Aldrich | 0.98 | Distillation | 0.997 | GC | 0.0002 |
| Ethyl benzoate (1) Sigma Aldrich 0.99 None - - - Ethyl benzoate (1) Sigma Aldrich 0.988 Distillation 0.996 CC 0.0002 Ethyl benzoate (1) Sigma Aldrich 0.99 Distillation 0.996 CC 0.0002 n-Heptane (1) Sigma Aldrich 0.99 None - - - Heptan-2-one (1) Sigma Aldrich 0.99 None - - - - Heptan-1-ol (1) Sigma Aldrich 0.99 None - - - - Leptane-Loi (1) Sigma Aldrich 0.98 Distillation 0.996 CC 0.0001 Leptane-Loi (1) Sigma Aldrich 0.98 Distillation 0.997 CC 0.0002 2-Hydroxyacteophenol (1) Sigma Aldrich 0.98 Distillation 0.997 CC 0.0002 2-Hydroxyacteophenol (1) Sigma Aldrich 0.98 Distillation 0.997 CC 0.0002 2-Hydroxya | Ethanol (1) | Sigma Aldrich | 0.98 | Distillation | 0.996 | GC | 0.0004 |
| Ethyl skicylate (1) Sigma Aldrich 0.98 Distillation 0.995 CC 0.0002 Fluorobenzene (1) Sigma Aldrich 0.99 Distillation 0.998 CC 0.0002 Fluorobenzene (1) Sigma Aldrich 0.99 None - - - Heptan-2-one (1) Sigma Aldrich 0.99 None - - - Hextan (1) Sigma Aldrich 0.99 None - - - 2-Hydroxyactophenone (1) Sigma Aldrich 0.98 Distillation 0.997 CC 0.0003 2-Hydroxyactophenone (1) Sigma Aldrich 0.98 Distillation 0.998 CC 0.0004 2-Hydroxyactophenone (1) Sigma Aldrich 0.97 CC 0.0002 - 2-Hydroxyactophenol (1) Sigma Aldrich 0.97 Distillation 0.997 CC 0.0002 2-Hydroxyactophenol (1) Sigma Aldrich 0.97 Distillation 0.997 CC 0.0002 4-Methoxyphenol (1) Sigma A | Ethyl acetate (1) | Sigma Aldrich | 0.99 | None | - | - | - |
| Ethyl sakicylate (1) Sigma Aldrich 0.98 Distillation 0.996 GC 0.0003 n-Heptane (1) Sigma Aldrich 0.99 Distillation 0.998 GC 0.0002 n-Heptane (1) Sigma Aldrich 0.99 None - - - n-Hexane (1) Sigma Aldrich 0.98 Distillation 0.997 GC 0.0003 2-Hydroxyacetophenone (1) Sigma Aldrich 0.98 Distillation 0.996 GC 0.0003 2-Hydroxyacetophenone (1) Sigma Aldrich 0.98 Distillation 0.996 GC 0.0004 4chabryphenol (1) Sigma Aldrich 0.98 Distillation 0.997 GC 0.0002 4-Methoxyphenol (1) Sigma Aldrich 0.97 Distillation 0.997 GC 0.0002 4-Methoxyphenol (1) Sigma Aldrich 0.99 None - - - 4-Methoxyphenol (1) Sigma Aldrich 0.99 None - - - Methyl propionate (1) <td>Ethyl benzoate (1)</td> <td>Sigma Aldrich</td> <td>0.98</td> <td>Distillation</td> <td>0.995</td> <td>GC</td> <td>0.0002</td> | Ethyl benzoate (1) | Sigma Aldrich | 0.98 | Distillation | 0.995 | GC | 0.0002 |
| Fluorobenzene (1)Sigma Aldrich0.99Distillation0.998GC0.0002Heptan (1)Sigma Aldrich0.99NoneHeptan-2-one (1)Sigma Aldrich0.98Distillation0.997GC0.00032-Hydroxyacetophenone (1)Sigma Aldrich0.98Distillation0.996GC0.00032-Hydroxyacetophenone (1)Sigma Aldrich0.98Distillation0.996GC0.0004Methanol (1)Sigma Aldrich0.98Distillation0.997GC0.0004Methoxyphenol (1)Sigma Aldrich0.98Distillation0.997GC0.00022-Methoxyphenol (1)Sigma Aldrich0.97Recrystallization0.997GC0.00023-Methoxyphenol (1)Sigma Aldrich0.97Recrystallization0.995GC0.00024-Methoxyphenol (1)Sigma Aldrich0.99NoneMethyl pactate (1)Sigma Aldrich0.99NoneMethyl porionate (1)Sigma Aldrich0.99Distillation0.997GC0.0002Methyl porionate (1)Sigma Aldrich0.98Distillation0.997GC0.0002Methyl porionate (1)Sigma Aldrich0.98Recrystallization0.996GC0.0002Methyl porionate (1)Sigma Aldrich0.98Distillation0.997GC0.0002Nama-2-one (1)Sigma Aldrich0.98 <t< td=""><td>Ethyl salicylate (l)</td><td>Sigma Aldrich</td><td>0.98</td><td>Distillation</td><td>0.996</td><td>GC</td><td>0.0003</td></t<> | Ethyl salicylate (l) | Sigma Aldrich | 0.98 | Distillation | 0.996 | GC | 0.0003 |
| n-Heptane (1) Sigma Aldrich 0.99 None - <t< td=""><td>Fluorobenzene (1)</td><td>Sigma Aldrich</td><td>0.99</td><td>Distillation</td><td>0.998</td><td>GC</td><td>0.0002</td></t<> | Fluorobenzene (1) | Sigma Aldrich | 0.99 | Distillation | 0.998 | GC | 0.0002 |
| Heptan-2-one (1)Sigma Aldrich0.98Distillation0.99/C.C0.0002 $-$ -Hexane (1)Sigma Aldrich0.99None $ -$ Hexan-1-0 (1)Sigma Aldrich0.98Distillation0.996C.C0.0003Indole (cr)Sigma Aldrich0.98Distillation0.998C.C0.0004Methanol (1)Sigma Aldrich0.98Distillation0.997C.C0.00022-Methoxyphenol (1)Sigma Aldrich0.97Recrystallization0.997C.C0.00023-Methoxyphenol (1)Sigma Aldrich0.97Recrystallization0.995C.C0.00024-Methoxyphenol (1)Sigma Aldrich0.97Recrystallization0.995C.C0.00024-Methoxyphenol (1)Sigma Aldrich0.97Recrystallization0.995C.C0.0002Methyl acetate (1)Sigma Aldrich0.97Distillation0.997C.C0.0002Methyl propinat (1)Sigma Aldrich0.98Distillation0.997C.C0.0002Methyl propinat (1)Sigma Aldrich0.98Distillation0.997C.C0.0002n-Nonane (1)Sigma Aldrich0.98None $ -$ Nonan-2-one (1)Sigma Aldrich0.98Distillation0.998C.C0.0002n-Nonan-2-one (1)Sigma Aldrich0.98Distillation0.998C.C0.0002Pentan-1-0 (1)Sigma Aldrich0.98 <t< td=""><td>n-Heptane (l)</td><td>Sigma Aldrich</td><td>0.99</td><td>None</td><td>-</td><td>-</td><td>-</td></t<> | n-Heptane (l) | Sigma Aldrich | 0.99 | None | - | - | - |
| <i>h</i> -Hexan(1)Sigma Aldrich0.99None <i>l</i> -kxan(-1-ol(1)Sigma Aldrich0.98Distillation0.996GC0.00032-Hydroxyacetophenoe (1)Sigma Aldrich0.98Sublimation0.998GC0.0004Methanol (1)Sigma Aldrich0.98Distillation0.998GC0.00022-Methoxyphenol (1)Sigma Aldrich0.97Distillation0.997GC0.00023-Methoxyphenol (1)Sigma Aldrich0.97None4-Methoxyphenol (1)Sigma Aldrich0.97NoneMethyl actate (1)Sigma Aldrich0.997GC0.00020.00024-Methoxyphenol (1)Sigma Aldrich0.99NoneMethyl benzoate (1)Sigma Aldrich0.99NoneMethyl propionate (1)Sigma Aldrich0.99Distillation0.997GC0.0002Methyl salicylate (1)Sigma Aldrich0.98Distillation0.997GC0.0002Methyl salicylate (1)Sigma Aldrich0.99NoneNonar-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002Octan -1-ol(1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-1-ol(1)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-2-one (1) <td>Heptan-2-one (1)</td> <td>Sigma Aldrich</td> <td>0.98</td> <td>Distillation</td> <td>0.997</td> <td>GC</td> <td>0.0002</td> | Heptan-2-one (1) | Sigma Aldrich | 0.98 | Distillation | 0.997 | GC | 0.0002 |
| IncluditDistiliationDistiliationDistiliationDistiliationCC0.0003Indole (rr)Sigma Aldrich0.98Distiliation0.998CC0.00042-Methoxyphenol (1)Sigma Aldrich0.98Distiliation0.997CC0.00023-Methoxyphenol (1)Sigma Aldrich0.97Pistiliation0.997CC0.00023-Methoxyphenol (1)Sigma Aldrich0.97Recrystalization0.997CC0.00024-Methoxyphenol (1)Sigma Aldrich0.97Recrystalization0.997CC0.0002Methyl acetate (1)Sigma Aldrich0.99NoneMethyl acetate (1)Sigma Aldrich0.99NoneMethyl propionate (1)Sigma Aldrich0.99Distiliation0.997CC0.0002Methyl propionate (1)Sigma Aldrich0.98Distiliation0.997CC0.0002Naphtalene (cr)Sigma Aldrich0.98NoneNona-2-one (1)Sigma Aldrich0.98Distiliation0.998CC0.0002Octan-1-ol (1)Sigma Aldrich0.98Distiliation0.998CC0.0002Pentan-2-one (1)Sigma Aldrich0.98Distiliation0.998CC0.0002Pentan-2-one (1)Sigma Aldrich0.98Distiliation0.998CC0.0002Pentan-2-one (1)Sigma Aldrich0.98Distiliation0.998CC< | n-Hexane (I) | Sigma Aldrich | 0.99 | None | - | - | - |
| | 2-Hydroxy2cetophenone (1) | Sigma Aldrich | 0.98 | Distillation | 0.997 | GC | 0.0003 |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | Indole (cr) | Sigma Aldrich | 0.98 | Sublimation | 0.990 | GC | 0.0003 |
| 2-Methoxyphenol (1)Sigma Aldrich0.93Distillation0.997GC0.00023-Methoxyphenol (1)Sigma Aldrich0.97Distillation0.997GC0.00024-Methoxyphenol (1)Sigma Aldrich0.97Recrystallization0.995GC0.0002Methyl acetate (1)Sigma Aldrich0.99NoneMethyl benzoate (1)Sigma Aldrich0.99Distillation0.997GC0.0002Methyl propionate (1)Sigma Aldrich0.99Distillation0.997GC0.0002Methyl propionate (1)Sigma Aldrich0.98Recrystallization0.997GC0.0002Naphthalene (cr)Sigma Aldrich0.98Recrystallization0.996GC0.0002Nonan-2-one (1)Sigma Aldrich0.99NoneOctan-1-0l (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-1-ol (1)Sigma Aldrich0.98 | Methanol (1) | Sigma Aldrich | 0.98 | Distillation | 0.998 | GC | 0.0004 |
| 3-Methoxyphenol (1) Sigma Aldrich 0.97 Distillation 0.997 GC 0.0002 4-Methoxyphenol (cr) Sigma Aldrich 0.97 Recrystallization 0.995 GC 0.0002 Methyl zertatet (1) Sigma Aldrich 0.99 None - - - Methyl zertatet (1) Sigma Aldrich 0.98 Distillation 0.997 GC 0.0002 Methyl zertatet (1) Sigma Aldrich 0.99 Distillation 0.997 GC 0.0002 Methyl salicylate (1) Sigma Aldrich 0.99 Distillation 0.997 GC 0.0002 Methyl salicylate (1) Sigma Aldrich 0.98 Distillation 0.997 GC 0.0002 Naphthalene (cr) Sigma Aldrich 0.98 Recrystallization 0.996 GC 0.0002 n-Otane (1) Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Cetan-1-01 (1) Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Pentan-1-01 (1) Sigma Aldrich 0.98 Distillation 0.998 | 2-Methoxyphenol (1) | Sigma Aldrich | 0.98 | Distillation | 0.997 | GC | 0.0002 |
| 4-Methoxyphenol (cr) Sigma Aldrich 0.97 Recrystallization 0.995 GC 0.0004 Methyl acetate (l) Sigma Aldrich 0.99 None - - - - Methyl acetate (l) Sigma Aldrich 0.99 Distillation 0.998 GC 0.0002 Methyl propionate (l) Sigma Aldrich 0.997 GC 0.0002 Methyl propionate (l) Sigma Aldrich 0.98 Distillation 0.997 GC 0.0002 Naphtalene (cr) Sigma Aldrich 0.98 Recrystallization 0.996 GC 0.0002 Nonan-2-one (l) Sigma Aldrich 0.98 None - - - - Octan -1-0 (l) Sigma Aldrich 0.99 None - | 3-Methoxyphenol (1) | Sigma Aldrich | 0.97 | Distillation | 0.997 | GC | 0.0002 |
| Methyl acerate (1)Sigma Aldrich0.99NoneMethyl benzate (1)Sigma Aldrich0.98Distillation0.998GC0.0002Mesitylene (1)Sigma Aldrich0.997GC0.0002Methyl propionate (1)Sigma Aldrich0.99Distillation0.997GC0.0002Methyl salicylate (1)Sigma Aldrich0.98Recrystallization0.997GC0.0002Methyl salicylate (1)Sigma Aldrich0.98Recrystallization0.996GC0.0002nonane (1)Sigma Aldrich0.99NoneNonan-2-one (1)Sigma Aldrich0.99NoneOctan-1-0 (1)Sigma Aldrich0.98Distillation0.998GC0.0002Octan-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.00022-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.00022-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.00022-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-01 (1)Sigma Aldrich0.98Distillation0.998GC0.0002 <t< td=""><td>4-Methoxyphenol (cr)</td><td>Sigma Aldrich</td><td>0.97</td><td>Recrystallization</td><td>0.995</td><td>GC</td><td>0.0004</td></t<> | 4-Methoxyphenol (cr) | Sigma Aldrich | 0.97 | Recrystallization | 0.995 | GC | 0.0004 |
| Methyl benzoate (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Mesitylene (1)Sigma Aldrich 0.99 Distillation 0.997 GC 0.0002 Methyl propionate (1)Sigma Aldrich 0.99 Distillation 0.997 GC 0.0002 Naphthalene (cr)Sigma Aldrich 0.98 Recrystallization 0.997 GC 0.0002 Naphthalene (cr)Sigma Aldrich 0.98 None $ -$ Nonan-2-one (1)Sigma Aldrich 0.99 None $ -$ Octan-1-ol (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Pentan-2-one (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Pentan-1-ol (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 2-Picoline (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 2-Picoline (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Propan-1-ol (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 <tr< td=""><td>Methyl acetate (l)</td><td>Sigma Aldrich</td><td>0.99</td><td>None</td><td>-</td><td>-</td><td>-</td></tr<> | Methyl acetate (l) | Sigma Aldrich | 0.99 | None | - | - | - |
| Mesitylene (1)Sigma Aldrich0.97GC0.0002Methyl propionate (1)Sigma Aldrich0.99Distillation0.997GC0.0002Naphthalene (cr)Sigma Aldrich0.98Distillation0.997GC0.0002Naphthalene (cr)Sigma Aldrich0.98Recrystallization0.996GC0.0002 <i>n</i> -Nonane (1)Sigma Aldrich0.99NoneNonar-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002 <i>n</i> -Octane (1)Sigma Aldrich0.98Distillation0.998GC0.0002Octan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.00022-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.00023-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.00024-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.0002P | Methyl benzoate (l) | Sigma Aldrich | 0.98 | Distillation | 0.998 | GC | 0.0002 |
| Methyl propionate (1) Sigma Aldrich 0.99 Distillation 0.997 GC 0.0002 Methyl salicylate (1) Sigma Aldrich 0.98 Distillation 0.997 GC 0.0002 naphthalene (cr) Sigma Aldrich 0.98 Recrystallization 0.996 GC 0.0002 n-Nonane (1) Sigma Aldrich 0.99 None - - - n-Octane (1) Sigma Aldrich 0.99 None - - - Octan-1-ol (1) Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Pentan-2-one (1) Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Pentan-1-ol (1) Sigma Aldrich 0.98 Distillation 0.998 GC 0.0004 2-Picoline (1) Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 2-Picoline (1) Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Propan-1-ol (1) | Mesitylene (1) | Sigma Aldrich | 0.97 | Distillation | 0.997 | GC | 0.0002 |
| Methyl salicylate (1)Sigma Aldrich0.98Distillation0.997GC0.0002Naphthalene (cr)Sigma Aldrich0.98Recrystallization0.996GC0.0005n-Nonane (1)Sigma Aldrich0.99NoneNonan-2-one (1)Sigma Aldrich0.99Distillation0.998GC0.0002n-Octane (1)Sigma Aldrich0.99NoneOctan-1-01 (1)Sigma Aldrich0.98Distillation0.998GC0.0002Octan-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.00022-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.00023-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.00024-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propinitrile (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propyl acetate (1)Sigma Aldrich0.98Distillation0.999GC0.0002Propyl acetate (1)Sigma Aldrich0.98Distillation0.998GC0.0002 | Methyl propionate (l) | Sigma Aldrich | 0.99 | Distillation | 0.997 | GC | 0.0002 |
| Naphthalene (cr)Sigma Aldrich0.98Recrystallization0.996GC0.0005 n -Nonane (l)Sigma Aldrich0.99NoneNonan-2-one (l)Sigma Aldrich0.99NoneOctan-1-ol (l)Sigma Aldrich0.99NoneOctan-1-ol (l)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (l)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (l)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-1-ol (l)Sigma Aldrich0.98Distillation0.998GC0.00022-Picoline (l)Sigma Aldrich0.98Distillation0.998GC0.00023-Picoline (l)Sigma Aldrich0.98Distillation0.998GC0.00024-Picoline (l)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (l)Sigma Aldrich0.98Distillation0.998GC0.0002Propiontrile (l)Sigma Aldrich0.98Distillation0.998GC0.0002Propyl cectate (l)Sigma Aldrich0.98Distillation0.998GC0.0002Propyl benzoate (l)Sigma Aldrich0.98Distillation0.999GC0.0002Propyl benzoate (l)Sigma Aldrich0.98Sublimation0.998GC | Methyl salicylate (l) | Sigma Aldrich | 0.98 | Distillation | 0.997 | GC | 0.0002 |
| n-Nonane (1)Sigma Aldrich0.99None $ -$ Nonan-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002 n -Octane (1)Sigma Aldrich0.98Distillation0.998GC0.0003Octan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.00022-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.00023-Picoline (1)Sigma Aldrich0.98Distillation0.997GC0.00024-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.00024-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propyl acetate (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propyl benzoate (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pyrazole (cr)Sigma Aldrich0.98Distillation0.998GC0.0002Pyridine (1)Sigma Aldrich0.98Distillation0.998GC </td <td>Naphthalene (cr)</td> <td>Sigma Aldrich</td> <td>0.98</td> <td>Recrystallization</td> <td>0.996</td> <td>GC</td> <td>0.0005</td> | Naphthalene (cr) | Sigma Aldrich | 0.98 | Recrystallization | 0.996 | GC | 0.0005 |
| Nonline2-One (1)Signal Aldrich0.98Distillation0.998GC0.0002 n -Octan-1-ol (1)Signa Aldrich0.99NoneOctan-1-ol (1)Signa Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (1)Signa Aldrich0.98Distillation0.998GC0.0002Pentan-1-ol (1)Signa Aldrich0.98Distillation0.998GC0.00022-Picoline (1)Signa Aldrich0.98Distillation0.998GC0.00023-Picoline (1)Signa Aldrich0.98Distillation0.998GC0.00023-Picoline (1)Signa Aldrich0.98Distillation0.998GC0.00024-Picoline (1)Signa Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Signa Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Signa Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Signa Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Signa Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Signa Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Signa Aldrich0.98Distillation0.999GC0.0002Propay lacetate (1)Signa Aldrich0.98Distillation0.999GC< | <i>n</i> -Nonane (1) | Sigma Aldrich | 0.99 | None | - | - | - |
| In-Octanie (1)Sigma Aldrich0.95NoteOctan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.00020.00020.00020.00020.00020.00020.00020.00020.00020.00020.00020.00020.0002 <td>Nonan-2-one (1)</td> <td>Sigma Aldrich</td> <td>0.98</td> <td>Nono</td> <td>0.998</td> <td>GC</td> <td>0.0002</td> | Nonan-2-one (1) | Sigma Aldrich | 0.98 | Nono | 0.998 | GC | 0.0002 |
| Octan - 2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.00022-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.00023-Picoline (1)Sigma Aldrich0.98Distillation0.997GC0.00024-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propionitrile (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propyl acetate (1)Sigma Aldrich0.98Distillation0.999GC0.0002Propyl benzoate (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pyrazole (cr)Sigma Aldrich0.98Distillation0.998GC0.0002Pritine (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pritachloromethane (1)Ekos Sigma Aldrich0.98Distillation0.998GC0.0002Trit-n-butylamine (1)Sigma Aldrich0.98Distillation0.998GC0.0002richloromethane (1)Sigma Aldrich0.98Distil | Ω (1) Ω | Sigma Aldrich | 0.99 | Distillation | - | - | - |
| Octom L of (f)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-2-one (l)Sigma Aldrich0.98Distillation0.998GC0.0002Pentan-1-ol (l)Sigma Aldrich0.98Distillation0.998GC0.00023-Picoline (l)Sigma Aldrich0.98Distillation0.997GC0.00024-Picoline (l)Sigma Aldrich0.98Distillation0.998GC0.00024-Picoline (l)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (l)Sigma Aldrich0.98Distillation0.998GC0.0002Propinitrile (l)Sigma Aldrich0.98Distillation0.998GC0.0002Propyl acetate (l)Sigma Aldrich0.98Distillation0.999GC0.0002Propyl benzoate (l)Sigma Aldrich0.97Distillation0.999GC0.0002Pyrazole (cr)Sigma Aldrich0.98Distillation0.998GC0.0002Pyrazole (cr)Sigma Aldrich0.98Distillation0.998GC0.0002Tetrachloromethane (l)Ekos Ekos Elgma Aldrich0.98Distillation0.998GC0.0002Tri-n-butylamine (l)Sigma Aldrich0.98Distillation0.998GC0.0002Tri-n-butylamine (l)Sigma Aldrich0.98Distillation0.998GC0.0002o-Xylene (l)Sigma Aldrich0.98Di | Octan-2-one(1) | Sigma Aldrich | 0.98 | Distillation | 0.998 | GC | 0.0003 |
| Pentan-1-ol (l)Sigma Aldrich0.98Distillation0.998GC0.00042-Picoline (l)Sigma Aldrich0.98Distillation0.998GC0.00023-Picoline (l)Sigma Aldrich0.98Distillation0.997GC0.00024-Picoline (l)Sigma Aldrich0.98Distillation0.998GC0.00024-Picoline (l)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (l)Sigma Aldrich0.98Distillation0.998GC0.0002Propionitrile (l)Sigma Aldrich0.98Distillation0.998GC0.0002Propyl acetate (l)Sigma Aldrich0.97Distillation0.999GC0.0002Propyl benzoate (l)Sigma Aldrich0.98Sublimation0.998GC0.0002Pyrazole (cr)Sigma Aldrich0.98Distillation0.998GC0.0002Pyrazole (cr)Sigma Aldrich0.98Distillation0.998GC0.0002Pyridine (l)Sigma Aldrich0.98Distillation0.998GC0.0002Tetrahydrofuran (l)Sigma Aldrich0.98Distillation0.998GC0.0002Tri-n-butylamine (l)Sigma Aldrich0.98Distillation0.998GC0.0002Tri-n-butylamine (l)Sigma Aldrich0.98Distillation0.999GC0.0002o-Xylene (l)Sigma Aldrich0.99Distillation0.998< | Pentan-2-one (1) | Sigma Aldrich | 0.98 | Distillation | 0.998 | GC | 0.0002 |
| 2-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.00023-Picoline (1)Sigma Aldrich0.98Distillation0.997GC0.00024-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propionitrile (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propyl acetate (1)Sigma Aldrich0.98Distillation0.999GC0.0002Propyl benzoate (1)Sigma Aldrich0.97Distillation0.999GC0.0002Pyrazole (cr)Sigma Aldrich0.98Sublimation0.998GC0.0002Pyridine (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pyridine (1)Sigma Aldrich0.98Distillation0.998GC0.0002Tetrachloromethane (1)Ekos Sigma Aldrich0.98Distillation0.998GC0.0002Tri-n-butylamine (1)Sigma Aldrich0.98Distillation0.998GC0.0002Trichloromethane (1)Sigma Aldrich0.98Distillation0.998GC0.0002o-Xylene (1)Sigma Aldrich0.98Distillation0.999GC0.0002o-Xylene (1)Sigma Aldrich0.99Distillation0.998GC0.0002o-Xylene (1)Sigma Aldrich0.99Distillation | Pentan-1-ol (1) | Sigma Aldrich | 0.98 | Distillation | 0.998 | GC | 0.0004 |
| 3-Picoline (1)Sigma Aldrich0.98Distillation0.997GC0.00024-Picoline (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (1)Sigma Aldrich0.98Distillation0.998GC0.0002Propionitrile (1)Sigma Aldrich0.98Distillation0.999GC0.0002Propyl accate (1)Sigma Aldrich0.97Distillation0.999GC0.0002Propyl benzoate (1)Sigma Aldrich0.97Distillation0.999GC0.0002Pyrazole (cr)Sigma Aldrich0.98Sublimation0.998GC0.0002Pyridine (1)Sigma Aldrich0.98Distillation0.998GC0.0002Pyridine (1)Sigma Aldrich0.98Distillation0.998GC0.0002Tetrachloromethane (1)Ekos ≥ 0.995 None0.0001Tetrahydrofuran (1)Sigma Aldrich0.98Distillation0.998GC0.0002Tri-n-butylamine (1)Sigma Aldrich0.98Distillation0.998GC0.0002ortichloromethane (1)Sigma Aldrich0.98Distillation0.999GC0.0002o-Xylene (1)Sigma Aldrich0.98Distillation0.999GC0.0002o-Xylene (1)Sigma Aldrich0.99Distillation0.998GC0.0002o-Xylene (1)Sigma Aldrich0.99Distillation0.998GC | 2-Picoline (1) | Sigma Aldrich | 0.98 | Distillation | 0.998 | GC | 0.0002 |
| 4-Picoline (l)Sigma Aldrich0.98Distillation0.998GC0.0002Propan-1-ol (l)Sigma Aldrich0.98Distillation0.998GC0.0004Propionitrile (l)Sigma Aldrich0.98Distillation0.998GC0.0002Propyl acetate (l)Sigma Aldrich0.98Distillation0.999GC0.0002Propyl benzoate (l)Sigma Aldrich0.97Distillation0.999GC0.0002Pyrazole (cr)Sigma Aldrich0.98Sublimation0.998GC0.0002Pyridine (l)Sigma Aldrich0.98Distillation0.998GC0.0002Tetrachloromethane (l)Ekos \geq 0.995None0.0001Tetrahydrofuran (l)Sigma Aldrich0.98Distillation0.998GC0.0002Tri-n-butylamine (l)Sigma Aldrich0.98Distillation0.998GC0.0002Trichloromethane (l)Sigma Aldrich0.98Distillation0.998GC0.0002Tri-n-butylamine (l)Sigma Aldrich0.98Distillation0.998GC0.0002o-Xylene (l)Sigma Aldrich0.99Distillation0.998GC0.0002o-Xylene (l)Sigma Aldrich0.99Distillation0.998GC0.0002o-Xylene (l)Sigma Aldrich0.99Distillation0.998GC0.0002o-Xylene (l)Sigma Aldrich0.99Distillation0.998GC | 3-Picoline (l) | Sigma Aldrich | 0.98 | Distillation | 0.997 | GC | 0.0002 |
| Propan-1-ol (l)Sigma Aldrich0.98Distillation0.998GC0.0004Propionitrile (l)Sigma Aldrich0.98Distillation0.998GC0.0002Propyl acetate (l)Sigma Aldrich0.98Distillation0.999GC0.0002Propyl benzoate (l)Sigma Aldrich0.97Distillation0.999GC0.0002Pyrazole (cr)Sigma Aldrich0.98Sublimation0.998GC0.0002Pyridine (l)Sigma Aldrich0.98Distillation0.998GC0.0002Tetrachloromethane (l)Ekos ≥ 0.995 None-0.0001Tetrahydrofuran (l)Sigma Aldrich0.98Distillation0.998GC0.0002Tri-n-butylamine (l)Sigma Aldrich0.98Distillation0.998GC0.0002Trichloromethane (l)Sigma Aldrich0.98Distillation0.998GC0.0002Tri-n-butylamine (l)Sigma Aldrich0.98Distillation0.999GC0.0002o-Xylene (l)Sigma Aldrich0.99Distillation0.998GC0.0002o-Xylene (l)Sigma Aldrich0.99Distillation0.998GC0.0002 | 4-Picoline (1) | Sigma Aldrich | 0.98 | Distillation | 0.998 | GC | 0.0002 |
| Propionitrile (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Propyl acetate (1)Sigma Aldrich 0.98 Distillation 0.999 GC 0.0002 Propyl benzoate (1)Sigma Aldrich 0.97 Distillation 0.999 GC 0.0002 Pyrazole (cr)Sigma Aldrich 0.98 Sublimation 0.998 GC 0.0002 Pyridine (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Tetrachoromethane (1)Ekos 0.995 None- $ 0.0001$ Tetrachoromethane (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Tri-n-butylamine (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Trichloromethane (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Tri-n-butylamine (1)Sigma Aldrich 0.98 Distillation 0.999 GC 0.0002 σ -Xylene (1)Sigma Aldrich 0.99 Distillation 0.998 GC 0.0002 σ -Xylene (1)Sigma Aldrich 0.99 Distillation 0.998 GC 0.0002 | Propan-1-ol (l) | Sigma Aldrich | 0.98 | Distillation | 0.998 | GC | 0.0004 |
| Propyl acetate (1)Sigma Aldrich 0.98 Distillation 0.999 GC 0.0002 Propyl benzoate (1)Sigma Aldrich 0.97 Distillation 0.999 GC 0.0002 Pyrazole (cr)Sigma Aldrich 0.98 Sublimation 0.998 GC 0.0004 Pyridine (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Tetrachloromethane (1)Ekos ≥ 0.995 None 0.0001 Tetrachloromethane (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Tri-n-butylamine (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Trichloromethane (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Trichloromethane (1)Sigma Aldrich 0.98 Distillation 0.999 GC 0.0002 Trichloromethane (1)Sigma Aldrich 0.98 Distillation 0.999 GC 0.0002 σ -Xylene (1)Sigma Aldrich 0.99 Distillation 0.998 GC 0.0002 | Propionitrile (1) | Sigma Aldrich | 0.98 | Distillation | 0.998 | GC | 0.0002 |
| Propyl benzoate (1)Sigma Aldrich 0.97 Distillation 0.999 GC 0.0002 Pyrazole (cr)Sigma Aldrich 0.98 Sublimation 0.998 GC 0.0004 Pyridine (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Tetrachloromethane (1)Ekos ≥ 0.995 None 0.0002 Tetrachloromethane (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Tri-n-butylamine (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Trichloromethane (1)Sigma Aldrich 0.98 Distillation 0.999 GC 0.0002 ortichloromethane (1)Sigma Aldrich 0.98 Distillation 0.999 GC 0.0002 ortichloromethane (1)Sigma Aldrich 0.99 Distillation 0.998 GC 0.0002 | Propyl acetate (1) | Sigma Aldrich | 0.98 | Distillation | 0.999 | GC | 0.0002 |
| Pyrazole (cr)Sigma Aldrich0.98Subination0.998GC0.0004Pyridine (l)Sigma Aldrich0.98Distillation0.998GC0.0002Tetrachloromethane (l)Ekos ≥ 0.995 None0.0001Tetrahydrofuran (l)Sigma Aldrich0.98Distillation0.998GC0.0002Tri-n-butylamine (l)Sigma Aldrich0.98Distillation0.998GC0.0002Trichoromethane (l)Sigma Aldrich0.98Distillation0.999GC0.0002O-Xylene (l)Sigma Aldrich0.99Distillation0.998GC0.0002o-Xylene (l)Sigma Aldrich0.99Distillation0.998GC0.0002 | Propyl benzoate (l) | Sigma Aldrich | 0.97 | Distillation | 0.999 | GC | 0.0002 |
| Pyritine (1)Sigma Aldrich 0.98 Distillation 0.98 GC 0.0002 Tetrachloromethane (1)Ekos ≥ 0.995 None0.0001Tetrahydrofuran (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Tri- <i>n</i> -butylamine (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Trichoromethane (1)Sigma Aldrich 0.98 Distillation 0.999 GC 0.0002 <i>o</i> -Xylene (1)Sigma Aldrich 0.99 Distillation 0.998 GC 0.0002 | Pyrazole (cr) | Sigma Aldrich | 0.98 | Sublimation | 0.998 | GC | 0.0004 |
| Tetrachioromethane (1)EKOS ≥ 0.995 None $ 0.0001$ Tetrahydrofuran (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Tri- <i>n</i> -butylamine (1)Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 Trichloromethane (1)Sigma Aldrich 0.98 Distillation 0.999 GC 0.0002 o -Xylene (1)Sigma Aldrich 0.99 Distillation 0.998 GC 0.0002 | ryriaine (1) | Sigma Aldrich | 0.98 | Distillation | 0.998 | GC | 0.0002 |
| Tetranyuloutan (r)Sigma Aldrich0.50Distillation0.598GC0.0002Tri-n-butylamine (l)Sigma Aldrich0.98Distillation0.998GC0.0002Trichoromethane (l)Sigma Aldrich0.98Distillation0.999GC0.0002o-Xylene (l)Sigma Aldrich0.99Distillation0.998GC0.0002 | Tetrabydrofuran (1) | EKUS Sigma Aldrich | 0 08 ≥0.332 | Distillation | - | - | 0.0001 |
| Trichloromethane (1)Sigma Aldrich0.98Distillation0.999GC0.0002o-Xylene (1)Sigma Aldrich0.99Distillation0.998GC0.0002 | Tri- n -hutylamine (1) | Sigma Aldrich | 0.98 | Distillation | 0.998 | GC | 0.0002 |
| o-Xylene (1) Sigma Aldrich 0.99 Distillation 0.998 GC 0.0002 | Trichloromethane (1) | Sigma Aldrich | 0.98 | Distillation | 0.990 | GC | 0.0002 |
| | o-Xvlene (1) | Sigma Aldrich | 0.99 | Distillation | 0.998 | GC | 0.0002 |
| m-Xylene (1) Sigma Aldrich 0.98 Distillation 0.998 GC 0.0002 | <i>m</i> -Xylene (1) | Sigma Aldrich | 0.98 | Distillation | 0.998 | GC | 0.0002 |
| <i>p</i> -Xylene (1) Sigma Aldrich 0.99 Distillation 0.998 GC 0.0002 | p-Xylene (l) | Sigma Aldrich | 0.99 | Distillation | 0.998 | GC | 0.0002 |

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