

Solubility of Unsaturated Carboxylic Acids in Supercritical 1,1,1,2-Tetrafluoroethane (HFC 134a) and a Methodology for the Separation of Ternary Mixtures

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Supplementary Information

Table 1 Solubility data for crotonic acid in HFC 134a at 378 K

| Pressure | Mole fraction solubility |
|----------|--------------------------|
| 50 | 0.03457 |
| 70 | 0.03971 |
| 80 | 0.0477 |
| 90 | 0.04956 |
| 110 | 0.05116 |
| 130 | 0.05249 |
| 150 | 0.05404 |

Table 2 Solubility data for 6-methoxy-1-tetralone in HFC 134a at 378 K

| Pressure | Mole fraction solubility |
|----------|--------------------------|
| 70 | 0.02567 |
| 80 | 0.02586 |
| 100 | 0.02678 |
| 120 | 0.02714 |
| 150 | 0.02731 |
| 190 | 0.02742 |

Table 3 Solubility data for methylsuccinic acid in HFC 134a

| Temperature / K | Pressure / bar | Mole fraction solubility |
|-----------------|----------------|--------------------------|
| 378 | 50 | 0.00223 |
| 378 | 70 | 0.00387 |
| 378 | 90 | 0.00568 |
| 378 | 110 | 0.00661 |
| 378 | 140 | 0.00799 |
| 378 | 200 | 0.00859 |
| 383 | 50 | 0.0058 |
| 383 | 80 | 0.0092 |
| 383 | 100 | 0.01199 |
| 383 | 135 | 0.01373 |
| 383 | 140 | 0.01413 |
| 383 | 160 | 0.01439 |
| 383 | 180 | 0.01468 |

Table 4 Solubility data for α -acetamidocinnamic acid in HFC 134a at 378 K

| Pressure | Mole fraction solubility |
|----------|--------------------------|
| 40 | 5.03761E-4 |
| 60 | 0.00101 |
| 80 | 0.00112 |
| 125 | 0.00122 |
| 155 | 0.00133 |
| 170 | 0.00141 |
| 200 | 0.00146 |

Table 5 Solubility data for itaconic acid in HFC 134a

| Temperature / K | Pressure / bar | Mole fraction solubility |
|-----------------|----------------|--------------------------|
| 378 | 50 | 4.29916E-4 |
| 378 | 80 | 6.952E-4 |
| 378 | 105 | 9.37693E-4 |
| 378 | 140 | 0.00115 |
| 378 | 180 | 0.00116 |
| 383 | 35 | 4.69017E-4 |
| 383 | 60 | 7.59212E-4 |
| 383 | 90 | 0.00104 |
| 383 | 125 | 0.00131 |
| 383 | 140 | 0.00151 |
| 383 | 165 | 0.00157 |
| 383 | 185 | 0.0016 |
| 393 | 40 | 0.00114 |
| 393 | 70 | 0.0017 |
| 393 | 110 | 0.00296 |
| 393 | 130 | 0.00349 |
| 393 | 155 | 0.0039 |
| 393 | 190 | 0.00398 |
| 393 | 205 | 0.00406 |