Table 3. The best obtained results for ternary systems using **GA** and **PSO**.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **System** | **Model** |  | **GA** | | **PSO** | |  | |
|  |  |  |  | GA | PSO |
| Water (**1**)  Butyric acid (**2**)  n-hexane (**3**) | Wilson | 1-2 | 609.12 | -368.96 | 620.08 | -350.03 | 5.68 | 5.99 |
| 1-3 | -384.52 | 1035.67 | -379.00 | 1000.00 |
| 2-3 | -109.29 | 793.06 | -95.19 | 801.27 |
|  | | | | | | | |
| UNIQUAC | 1-2 | 376.36 | -750.11 | 390.12 | -733.29 | 1.100 | 1.025 |
| 1-3 | -306.30 | -1750.31 | -350.73 | -1830.29 |
| 2-3 | 202.65 | -1955.82 | 198.79 | -1800.17 |
|  | | | | | | | |
| NRTL | 1-2 | -675.27 | 565.00 | -690.08 | 566.08 | 0.986 | 1.001 |
| 1-3 | 1518.20 | 962.00 | 1500.00 | 923.27 |
| 2-3 | -273.85 | 762.58 | -290.14 | 800.02 |
|  |  | | | | | | | |
| Water (**1**)  Butyric acid (**2**)  n-hexanol (**3**) | Wilson | 1-2 | -519.63 | 1309.02 | -530.71 | 1200.15 | 6.85 | 6.93 |
| 1-3 | 754.09 | -693.27 | 800.01 | -710.02 |
| 2-3 | 162.39 | -30.017 | 263.88 | -102.88 |
|  | | | | | | | |
| UNIQUAC | 1-2 | -367.46 | 577.77 | -390.89 | 590.04 | 2.023 | 2.033 |
| 1-3 | -541.15 | -494.67 | -532.16 | -500.12 |
| 2-3 | 289.24 | -1710.34 | 302.14 | -1861.33 |
|  | | | | | | | |
| NRTL | 1-2 | 885.75 | 196.56 | 890.63 | 211.03 | 1.962 | 1.099 |
| 1-3 | 950.11 | -601.66 | 900.97 | -620.36 |
| 2-3 | -755.46 | 789.67 | -710.49 | 800.07 |