**Лабораторная работа 3 по Цифровому моделированию физико-химических систем**

Используя приведенные данные, подобрать константы в модели Вильсона и построить y-x и P-x диаграмму.

методика: см. стр. 276-277, первый алгоритм из раздела 8.6 справочника Шервуда (файл VLE\_по\_справочнику\_Шервуда.pdf)

подсказка: выполните минимизацию функции SUM[abs(gE\_exp – gE\_Wilson)] по параметрам по модели Вильсона и (x0 = [ ] = [10000; 5000], например). Для этого используйте scipy.optimize например, с методом Нелдера-Мида (*Nelder-Mead*).

Коэффициенты A, B, C в таблицах приведены для следующего уравнения

ln *Pi0*(мм.рт.ст.) = [*A* - *B* / ( *T* (K) + *C* )] (не забудьте перевести единицы давления после вычисления).

Исследуемая система (вариант):

1. 1-пропанол + вода
2. Ацетон + хлороформ
3. Ацетон + метанол
4. Ацетон + вода
5. Ацетон + толуол
6. Ацетон + изопропиловый спирт
7. Ацетон + н-гексан
8. Ацетонитрил + вода
9. Бензол + толуол
10. Четыреххлористый углерод + бензол
11. Хлороформ + метанол
12. Дихлорметан + метанол
13. Дихлорметан + этилацетат
14. Этанол + бензол
15. Этанол + вода
16. Этилацетат + этанол
17. Этилацетат + вода
18. Этилацетат + уксусная кислота
19. Метанол + бензол
20. Метанол + этилацетат
21. Метанол + вода
22. Метанол + изопропиловый спирт
23. Метанол + ацетонитрил
24. Метанол + толуол
25. Метилацетат + метанол
26. Метилацетат + этилацетат
27. Метилацетат + уксусная кислота
28. Метилацетат + вода
29. Н-гексан + этанол
30. Тетрагидрофуран + вода
31. Вода + уксусная кислота
32. Вода + н-бутанол
33. Вода + толуол
34. Вода + морфолин
35. Вода + пиридин
36. Вода + метил изобутилкетон

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| Вариант | 1 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.388 | 0.0486 |
| 0.300 | 0.405 | 0.0502 |
| 0.500 | 0.444 | 0.0502 |
| 0.700 | 0.453 | 0.0490 |
| 0.900 | 0.604 | 0.0417 |
| Параметры | |  |
|  | 1 | 2 |
| A | 17.54 | 18.30 |
| B | 3166.38 | 3816.44 |
| C | -80.15 | -46.13 |
| Tc, K | 536.70 | 647.30 |
| Pc, bar | 51.68 | 220.48 |
| ω | 0.62 | 0.34 |

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| Вариант | 2 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.055 | 0.2420 |
| 0.300 | 0.275 | 0.2216 |
| 0.500 | 0.589 | 0.2287 |
| 0.700 | 0.780 | 0.2546 |
| 0.900 | 0.951 | 0.2887 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.65 | 15.97 |
| B | 2940.46 | 2696.79 |
| C | -35.93 | -46.16 |
| Tc, K | 508.10 | 536.40 |
| Pc, bar | 47.01 | 54.72 |
| ω | 0.31 | 0.22 |

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| Вариант | 3 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.262 | 0.2066 |
| 0.300 | 0.489 | 0.2524 |
| 0.500 | 0.659 | 0.2792 |
| 0.700 | 0.741 | 0.2963 |
| 0.900 | 0.908 | 0.3056 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.65 | 18.59 |
| B | 2940.46 | 3626.55 |
| C | -35.93 | -34.29 |
| Tc, K | 508.10 | 512.60 |
| Pc, bar | 47.01 | 80.96 |
| ω | 0.31 | 0.56 |

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| Вариант | 4 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.871 | 0.2022 |
| 0.300 | 0.869 | 0.2489 |
| 0.500 | 0.925 | 0.2635 |
| 0.700 | 0.886 | 0.2776 |
| 0.900 | 0.951 | 0.2964 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.65 | 18.30 |
| B | 2940.46 | 3816.44 |
| C | -35.93 | -46.13 |
| Tc, K | 508.10 | 647.30 |
| Pc, bar | 47.01 | 220.48 |
| ω | 0.31 | 0.34 |

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| Вариант | 5 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.599 | 0.0838 |
| 0.300 | 0.781 | 0.1410 |
| 0.500 | 0.908 | 0.1876 |
| 0.700 | 0.910 | 0.2336 |
| 0.900 | 0.982 | 0.2815 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.65 | 16.01 |
| B | 2940.46 | 3096.52 |
| C | -35.93 | -53.67 |
| Tc, K | 508.10 | 591.70 |
| Pc, bar | 47.01 | 41.14 |
| ω | 0.31 | 0.26 |

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| Вариант | 6 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.555 | 0.1210 |
| 0.300 | 0.720 | 0.1785 |
| 0.500 | 0.846 | 0.2164 |
| 0.700 | 0.866 | 0.2514 |
| 0.900 | 0.963 | 0.2876 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.65 | 18.69 |
| B | 2940.46 | 3640.20 |
| C | -35.93 | -53.54 |
| Tc, K | 508.10 | 508.30 |
| Pc, bar | 47.01 | 47.62 |
| ω | 0.31 | 0.67 |

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| Вариант | 7 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.402 | 0.3065 |
| 0.300 | 0.536 | 0.3680 |
| 0.500 | 0.620 | 0.3832 |
| 0.700 | 0.635 | 0.3850 |
| 0.900 | 0.782 | 0.3604 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.65 | 15.84 |
| B | 2940.46 | 2697.55 |
| C | -35.93 | -48.78 |
| Tc, K | 508.10 | 507.40 |
| Pc, bar | 47.01 | 29.69 |
| ω | 0.31 | 0.30 |

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| Вариант | 8 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.719 | 0.1002 |
| 0.300 | 0.745 | 0.1176 |
| 0.500 | 0.799 | 0.1214 |
| 0.700 | 0.772 | 0.1239 |
| 0.900 | 0.861 | 0.1239 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.29 | 18.30 |
| B | 2945.47 | 3816.44 |
| C | -49.15 | -46.13 |
| Tc, K | 548.00 | 647.30 |
| Pc, bar | 48.33 | 220.48 |
| ω | 0.32 | 0.34 |

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| Вариант | 9 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.274 | 0.0468 |
| 0.300 | 0.568 | 0.0636 |
| 0.500 | 0.790 | 0.0811 |
| 0.700 | 0.861 | 0.0993 |
| 0.900 | 0.969 | 0.1177 |
| Параметры | |  |
|  | 1 | 2 |
| A | 15.90 | 16.01 |
| B | 2788.51 | 3096.52 |
| C | -52.36 | -53.67 |
| Tc, K | 562.10 | 591.70 |
| Pc, bar | 48.94 | 41.14 |
| ω | 0.21 | 0.26 |

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| Вариант | 10 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.130 | 0.1310 |
| 0.300 | 0.342 | 0.1379 |
| 0.500 | 0.562 | 0.1435 |
| 0.700 | 0.706 | 0.1478 |
| 0.900 | 0.908 | 0.1510 |
| Параметры | |  |
|  | 1 | 2 |
| A | 15.87 | 15.90 |
| B | 2808.19 | 2788.51 |
| C | -45.99 | -52.36 |
| Tc, K | 556.40 | 562.10 |
| Pc, bar | 45.60 | 48.94 |
| ω | 0.19 | 0.21 |

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| Вариант | 11 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.281 | 0.2113 |
| 0.300 | 0.522 | 0.2681 |
| 0.500 | 0.675 | 0.2976 |
| 0.700 | 0.709 | 0.3082 |
| 0.900 | 0.808 | 0.3025 |
| Параметры | |  |
|  | 1 | 2 |
| A | 15.97 | 18.59 |
| B | 2696.79 | 3626.55 |
| C | -46.16 | -34.29 |
| Tc, K | 536.40 | 512.60 |
| Pc, bar | 54.72 | 80.96 |
| ω | 0.22 | 0.56 |

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| Вариант | 12 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.494 | 0.2974 |
| 0.300 | 0.717 | 0.4702 |
| 0.500 | 0.839 | 0.5648 |
| 0.700 | 0.831 | 0.6092 |
| 0.900 | 0.892 | 0.6219 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.30 | 18.59 |
| B | 2622.44 | 3626.55 |
| C | -41.70 | -34.29 |
| Tc, K | 510.00 | 512.60 |
| Pc, bar | 60.80 | 80.96 |
| ω | 0.19 | 0.56 |

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| Вариант | 13 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.227 | 0.1488 |
| 0.300 | 0.569 | 0.2047 |
| 0.500 | 0.832 | 0.2872 |
| 0.700 | 0.904 | 0.3971 |
| 0.900 | 0.988 | 0.5227 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.30 | 16.15 |
| B | 2622.44 | 2790.50 |
| C | -41.70 | -57.15 |
| Tc, K | 510.00 | 523.20 |
| Pc, bar | 60.80 | 38.30 |
| ω | 0.19 | 0.36 |

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| Вариант | 14 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.244 | 0.1550 |
| 0.300 | 0.324 | 0.1630 |
| 0.500 | 0.379 | 0.1617 |
| 0.700 | 0.406 | 0.1545 |
| 0.900 | 0.580 | 0.1250 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.91 | 15.90 |
| B | 3803.98 | 2788.51 |
| C | -41.68 | -52.36 |
| Tc, K | 516.20 | 562.10 |
| Pc, bar | 63.83 | 48.94 |
| ω | 0.64 | 0.21 |

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| Вариант | 15 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.529 | 0.0604 |
| 0.300 | 0.632 | 0.0748 |
| 0.500 | 0.717 | 0.0797 |
| 0.700 | 0.733 | 0.0825 |
| 0.900 | 0.874 | 0.0824 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.91 | 18.30 |
| B | 3803.98 | 3816.44 |
| C | -41.68 | -46.13 |
| Tc, K | 516.20 | 647.30 |
| Pc, bar | 63.83 | 220.48 |
| ω | 0.64 | 0.34 |

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| Вариант | 16 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.286 | 0.1000 |
| 0.300 | 0.482 | 0.1200 |
| 0.500 | 0.628 | 0.1292 |
| 0.700 | 0.702 | 0.1335 |
| 0.900 | 0.882 | 0.1326 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.15 | 18.91 |
| B | 2790.50 | 3803.98 |
| C | -57.15 | -41.68 |
| Tc, K | 523.20 | 516.20 |
| Pc, bar | 38.30 | 63.83 |
| ω | 0.36 | 0.64 |

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| Вариант | 17 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.796 | 0.1397 |
| 0.300 | 0.770 | 0.1427 |
| 0.500 | 0.813 | 0.1438 |
| 0.700 | 0.774 | 0.1451 |
| 0.900 | 0.839 | 0.1444 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.15 | 18.30 |
| B | 2790.50 | 3816.44 |
| C | -57.15 | -46.13 |
| Tc, K | 523.20 | 647.30 |
| Pc, bar | 38.30 | 220.48 |
| ω | 0.36 | 0.34 |

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| Вариант | 18 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.359 | 0.0281 |
| 0.300 | 0.688 | 0.0465 |
| 0.500 | 0.892 | 0.0692 |
| 0.700 | 0.921 | 0.0962 |
| 0.900 | 0.988 | 0.1225 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.15 | 16.81 |
| B | 2790.50 | 3405.57 |
| C | -57.15 | -56.34 |
| Tc, K | 523.20 | 594.40 |
| Pc, bar | 38.30 | 57.86 |
| ω | 0.36 | 0.45 |

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| Вариант | 19 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.461 | 0.2181 |
| 0.300 | 0.511 | 0.2381 |
| 0.500 | 0.564 | 0.2415 |
| 0.700 | 0.570 | 0.2397 |
| 0.900 | 0.719 | 0.2168 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.59 | 15.90 |
| B | 3626.55 | 2788.51 |
| C | -34.29 | -52.36 |
| Tc, K | 512.60 | 562.10 |
| Pc, bar | 80.96 | 48.94 |
| ω | 0.56 | 0.21 |

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| Вариант | 20 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.276 | 0.1615 |
| 0.300 | 0.454 | 0.1887 |
| 0.500 | 0.579 | 0.1977 |
| 0.700 | 0.640 | 0.1982 |
| 0.900 | 0.828 | 0.1860 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.59 | 16.15 |
| B | 3626.55 | 2790.50 |
| C | -34.29 | -57.15 |
| Tc, K | 512.60 | 523.20 |
| Pc, bar | 80.96 | 38.30 |
| ω | 0.56 | 0.36 |

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| Вариант | 21 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.565 | 0.0643 |
| 0.300 | 0.740 | 0.0993 |
| 0.500 | 0.860 | 0.1211 |
| 0.700 | 0.871 | 0.1399 |
| 0.900 | 0.963 | 0.1590 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.59 | 18.30 |
| B | 3626.55 | 3816.44 |
| C | -34.29 | -46.13 |
| Tc, K | 512.60 | 647.30 |
| Pc, bar | 80.96 | 220.48 |
| ω | 0.56 | 0.34 |

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| Вариант | 22 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.245 | 0.0713 |
| 0.300 | 0.539 | 0.0936 |
| 0.500 | 0.762 | 0.1159 |
| 0.700 | 0.841 | 0.1376 |
| 0.900 | 0.961 | 0.1587 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.59 | 18.69 |
| B | 3626.55 | 3640.20 |
| C | -34.29 | -53.54 |
| Tc, K | 512.60 | 508.30 |
| Pc, bar | 80.96 | 47.62 |
| ω | 0.56 | 0.67 |

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| Вариант | 23 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.268 | 0.1417 |
| 0.300 | 0.478 | 0.1708 |
| 0.500 | 0.622 | 0.1835 |
| 0.700 | 0.681 | 0.1876 |
| 0.900 | 0.850 | 0.1815 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.59 | 16.29 |
| B | 3626.55 | 2945.47 |
| C | -34.29 | -49.15 |
| Tc, K | 512.60 | 548.00 |
| Pc, bar | 80.96 | 48.33 |
| ω | 0.56 | 0.32 |

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| Вариант | 24 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.763 | 0.1415 |
| 0.300 | 0.780 | 0.1668 |
| 0.500 | 0.833 | 0.1723 |
| 0.700 | 0.800 | 0.1763 |
| 0.900 | 0.881 | 0.1782 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.59 | 16.01 |
| B | 3626.55 | 3096.52 |
| C | -34.29 | -53.67 |
| Tc, K | 512.60 | 591.70 |
| Pc, bar | 80.96 | 41.14 |
| ω | 0.56 | 0.26 |

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| Вариант | 25 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.311 | 0.2214 |
| 0.300 | 0.519 | 0.2759 |
| 0.500 | 0.655 | 0.2999 |
| 0.700 | 0.705 | 0.3098 |
| 0.900 | 0.864 | 0.3048 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.13 | 18.59 |
| B | 2601.92 | 3626.55 |
| C | -56.15 | -34.29 |
| Tc, K | 506.80 | 512.60 |
| Pc, bar | 46.91 | 80.96 |
| ω | 0.32 | 0.56 |

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| Вариант | 26 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.201 | 0.1447 |
| 0.300 | 0.478 | 0.1762 |
| 0.500 | 0.712 | 0.2081 |
| 0.700 | 0.815 | 0.2403 |
| 0.900 | 0.953 | 0.2725 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.13 | 16.15 |
| B | 2601.92 | 2790.50 |
| C | -56.15 | -57.15 |
| Tc, K | 506.80 | 523.20 |
| Pc, bar | 46.91 | 38.30 |
| ω | 0.32 | 0.36 |

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| Вариант | 27 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.638 | 0.0489 |
| 0.300 | 0.846 | 0.1044 |
| 0.500 | 0.963 | 0.1579 |
| 0.700 | 0.941 | 0.2102 |
| 0.900 | 0.992 | 0.2623 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.13 | 16.81 |
| B | 2601.92 | 3405.57 |
| C | -56.15 | -56.34 |
| Tc, K | 506.80 | 594.40 |
| Pc, bar | 46.91 | 57.86 |
| ω | 0.32 | 0.45 |

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| Вариант | 28 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.903 | 0.2630 |
| 0.300 | 0.875 | 0.2796 |
| 0.500 | 0.923 | 0.2833 |
| 0.700 | 0.873 | 0.2874 |
| 0.900 | 0.923 | 0.2937 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.13 | 18.30 |
| B | 2601.92 | 3816.44 |
| C | -56.15 | -46.13 |
| Tc, K | 506.80 | 647.30 |
| Pc, bar | 46.91 | 220.48 |
| ω | 0.32 | 0.34 |

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| Вариант | 29 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.639 | 0.1962 |
| 0.300 | 0.706 | 0.2436 |
| 0.500 | 0.761 | 0.2518 |
| 0.700 | 0.726 | 0.2536 |
| 0.900 | 0.770 | 0.2514 |
| Параметры | |  |
|  | 1 | 2 |
| A | 15.84 | 18.91 |
| B | 2697.55 | 3803.98 |
| C | -48.78 | -41.68 |
| Tc, K | 507.40 | 516.20 |
| Pc, bar | 29.69 | 63.83 |
| ω | 0.30 | 0.64 |

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| Вариант | 30 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.870 | 0.2096 |
| 0.300 | 0.839 | 0.2134 |
| 0.500 | 0.885 | 0.2160 |
| 0.700 | 0.841 | 0.2196 |
| 0.900 | 0.902 | 0.2236 |
| Параметры | |  |
|  | 1 | 2 |
| A | 16.11 | 18.30 |
| B | 2768.38 | 3816.44 |
| C | -46.90 | -46.13 |
| Tc, K | 540.20 | 647.30 |
| Pc, bar | 51.88 | 220.48 |
| ω | 0.22 | 0.34 |

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| Вариант | 31 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.250 | 0.0244 |
| 0.300 | 0.480 | 0.0296 |
| 0.500 | 0.642 | 0.0324 |
| 0.700 | 0.706 | 0.0335 |
| 0.900 | 0.867 | 0.0331 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.30 | 16.81 |
| B | 3816.44 | 3405.57 |
| C | -46.13 | -56.34 |
| Tc, K | 647.30 | 594.40 |
| Pc, bar | 220.48 | 57.86 |
| ω | 0.34 | 0.45 |

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| Вариант | 32 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.718 | 0.0256 |
| 0.300 | 0.785 | 0.0349 |
| 0.500 | 0.846 | 0.0369 |
| 0.700 | 0.805 | 0.0374 |
| 0.900 | 0.834 | 0.0374 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.30 | 17.22 |
| B | 3816.44 | 3137.02 |
| C | -46.13 | -94.43 |
| Tc, K | 647.30 | 562.90 |
| Pc, bar | 220.48 | 44.18 |
| ω | 0.34 | 0.59 |

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| Вариант | 33 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.462 | 0.0693 |
| 0.300 | 0.444 | 0.0693 |
| 0.500 | 0.467 | 0.0693 |
| 0.700 | 0.440 | 0.0693 |
| 0.900 | 0.453 | 0.0693 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.30 | 16.01 |
| B | 3816.44 | 3096.52 |
| C | -46.13 | -53.67 |
| Tc, K | 647.30 | 591.70 |
| Pc, bar | 220.48 | 41.14 |
| ω | 0.34 | 0.26 |

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| Вариант | 34 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.205 | 0.0145 |
| 0.300 | 0.482 | 0.0178 |
| 0.500 | 0.728 | 0.0214 |
| 0.700 | 0.831 | 0.0253 |
| 0.900 | 0.961 | 0.0294 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.30 | 16.24 |
| B | 3816.44 | 3171.35 |
| C | -46.13 | -71.15 |
| Tc, K | 647.30 | 618.00 |
| Pc, bar | 220.48 | 54.72 |
| ω | 0.34 | 0.37 |

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| Вариант | 35 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.265 | 0.0339 |
| 0.300 | 0.482 | 0.0411 |
| 0.500 | 0.616 | 0.0439 |
| 0.700 | 0.640 | 0.0443 |
| 0.900 | 0.706 | 0.0432 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.30 | 16.09 |
| B | 3816.44 | 3095.13 |
| C | -46.13 | -61.15 |
| Tc, K | 647.30 | 620.00 |
| Pc, bar | 220.48 | 56.34 |
| ω | 0.34 | 0.24 |

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| Вариант | 36 |  |
| Данные VLE, T = | | 298.15K |
| X1 | Y1 | P, bar |
| 0.100 | 0.532 | 0.0530 |
| 0.300 | 0.542 | 0.0556 |
| 0.500 | 0.575 | 0.0558 |
| 0.700 | 0.542 | 0.0558 |
| 0.900 | 0.560 | 0.0557 |
| Параметры | |  |
|  | 1 | 2 |
| A | 18.30 | 15.72 |
| B | 3816.44 | 2893.66 |
| C | -46.13 | -70.75 |
| Tc, K | 647.30 | 571.00 |
| Pc, bar | 220.48 | 32.73 |
| ω | 0.34 | 0.40 |