Table S1. The Box–Behnken experimental design of PCA method with four independent variables

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| --- | --- | --- | --- | --- | --- |
| No. | PCA concentration (%) | Hydrolysis temperature (℃) | Hydrolysis time（min） | Liquid-solid ratio (ml/g) | aTotal extraction yield |
| 1 | 1 (90) | 1 (90) | 0 (55) | 0 (60) | 83.11 |
| 2 | -1 (70) | 0 (80) | 1 (60) | 0 (60) | 82.00 |
| 3 | -1 (70) | 1 (90) | 0 (55) | 0 (60) | 82.13 |
| 4 | 0 (80) | 0 (80) | 0 (55) | 0 (60) | 85.97 |
| 5 | -1 (70) | 0 (80) | -1 (50) | 0 (60) | 80.43 |
| 6 | 0 (80) | 0 (80) | 1 (60) | 1 (70) | 85.85 |
| 7 | -1 (70) | 0 (80) | 0 (55) | -1 (50) | 83.83 |
| 8 | 0 (80) | 0 (80) | 0 (55) | 0 (60) | 86.12 |
| 9 | 0 (80) | 0 (80) | -1 (50) | -1 (50) | 85.13 |
| 10 | 0 (80) | 0 (80) | 1 (60) | -1 (50) | 85.31 |
| 11 | 0 (80) | 0 (80) | -1 (50) | 1 (70) | 83.99 |
| 12 | 0 (80) | 1 (90) | 1 (60) | 0 (60) | 84.12 |
| 13 | 0 (80) | 1 (90) | -1 (50) | 0 (60) | 84.03 |
| 14 | 1 (90) | 0 (80) | 0 (55) | 1 (70) | 83.03 |
| 15 | 0 (80) | -1 (70) | 0 (55) | 1 (70) | 84.42 |
| 16 | 0 (80) | 0 (80) | 0 (55) | 0 (60) | 85.92 |
| 17 | 0 (80) | 1 (90) | 0 (55) | 1 (70) | 84.83 |
| 18 | 1 (90) | 0 (80) | 0 (55) | -1 (50) | 83.32 |
| 19 | 1 (90) | 0 (80) | -1 (50) | 0 (60) | 82.95 |
| 20 | -1 (70) | -1 (70) | 0 (55) | 0 (60) | 82.11 |
| 21 | 0 (80) | 0 (80) | 0 (55) | 0 (60) | 85.21 |
| 22 | 1 (90) | -1 (70) | 0 (55) | 0 (60) | 83.43 |
| 23 | 0 (80) | -1 (70) | 1 (60) | 0 (60) | 84.15 |
| 24 | 1 (90) | 0 (80) | 1 (60) | 0 (60) | 82.43 |
| 25 | 0 (80) | -1 (70) | 0 (55) | -1 (50) | 85.00 |
| 26 | 0 (80) | -1 (70) | -1 (50) | 0 (60) | 84.12 |
| 27 | -1 (70) | 0 (80) | 0 (55) | 1 (70) | 82.12 |
| 28 | 0 (80) | 0 (80) | 0 (55) | 0 (60) | 86.01 |
| 29 | 0 (80) | 1 (90) | 0 (55) | -1 (50) | 85.77 |

aTotal extraction yield (%) = Adenine extraction yield + Guanine extraction yield + Hypoxanthine extraction yield + Xanthine extraction yield

bExtraction yield (%) = (purine content in sample (mg)/sample mass (kg)) × 100