**Table S1:** Central Composite Design to optimize the significant variables for lipase production by *B. licheniformis* under solid state fermentation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Expt. No. | Temperature (oC) | pH | Moisture (%) | Biosurfactant (mg) | Experimental lipase activity (IU/g) | Model predicted lipase activity (IU/g) |
| 1 | 42.5 | 9 | 60 | 1.5125 | 35.25 | 36.76 |
| 2 | 50 | 10 | 50 | 1.025 | 40.28 | 33.41 |
| 3 | 42.5 | 9 | 60 | 0.5375 | 10.5 | 11.89 |
| 4 | 50 | 8 | 50 | 1.025 | 58.23 | 58.19 |
| 5 | 50 | 8 | 50 | 1.025 | 57.12 | 58.19 |
| 6 | 50 | 6 | 50 | 1.025 | 23 | 33.58 |
| 7 | 50 | 8 | 50 | 0.05 | 40.12 | 42.93 |
| 8 | 50 | 8 | 50 | 1.025 | 58.65 | 58.19 |
| 9 | 50 | 8 | 50 | 1.025 | 59.03 | 58.19 |
| 10 | 50 | 8 | 50 | 2 | 56.75 | 57.65 |
| 11 | 42.5 | 9 | 40 | 0.5375 | 20.13 | 23.28 |
| 12 | 50 | 8 | 50 | 1.025 | 57.72 | 58.19 |
| 13 | 42.5 | 7 | 40 | 0.5375 | 40.34 | 33.83 |
| 14 | 42.5 | 7 | 60 | 1.5125 | 48.37 | 45.17 |
| 15 | 57.5 | 9 | 40 | 0.5375 | 40.12 | 41.87 |
| 16 | 57.5 | 9 | 60 | 0.5375 | 45.19 | 42.96 |
| 17 | 42.5 | 7 | 40 | 1.5125 | 38.23 | 38.20 |
| 18 | 57.5 | 7 | 40 | 1.5125 | 26.3 | 23.47 |
| 19 | 57.5 | 7 | 60 | 0.5375 | 39.1 | 41.39 |
| 20 | 65 | 8 | 50 | 1.025 | 31.8 | 30.95 |
| 21 | 57.5 | 9 | 40 | 1.5125 | 37.38 | 40.51 |
| 22 | 50 | 8 | 50 | 1.025 | 58.4 | 58.19 |
| 23 | 57.5 | 9 | 60 | 1.5125 | 48.23 | 53.30 |
| 24 | 50 | 8 | 30 | 1.025 | 30.52 | 33.08 |
| 25 | 42.5 | 9 | 40 | 1.5125 | 40.18 | 36.45 |
| 26 | 57.5 | 7 | 40 | 0.5375 | 37.4 | 33.63 |
| 27 | 42.5 | 7 | 60 | 0.5375 | 34.5 | 29.10 |
| 28 | 50 | 8 | 70 | 1.025 | 40 | 41.15 |
| 29 | 57.5 | 7 | 60 | 1.5125 | 48.35 | 42.93 |
| 30 | 35 | 8 | 50 | 1.025 | 10.05 | 14.61 |