Table 1. Fertilizer formulations dried by Spray Drying.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Carrier /AI Ratio** | **Chitosan 1% w/v Solution (mL)** | **Potassium Phosphate 1% w/v Solution (mL)** | **Milli-Q Water (mL)** | **Final Volume**  **(mL)** |
| 5/2 | 25 | 10 | 65 | 100 |
| 1/1 | 25 | 25 | 50 | 100 |
| 5/1 | 25 | 5 | 30 | 100 |
| 1/2 | 25 | 50 | 25 | 100 |

Table 2. Levels for the experimental variables.

|  |  |  |
| --- | --- | --- |
| **Factor** | **Experimental Domain** | |
|  | Level (-) | Level (+) |
| Temperature | 120 °C | 150 °C |
| Air Pressure | 0.2 MPa | 0.4 MPa |
| Feed Rate | 1.4 mL/min | 3.6 mL/min |
| Extraction Rate | 6 m³/min | 10 m³/min |

Table 3. Particle size measured for each iteration.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Iteration** | **Temperature**  **(°C)** | **Air Pressure**  **(MPa)** | **Extraction Rate**  **(m³/min)** | **Feed Rate**  **(mL/min)** | **Particle Size**  (µm) |
| 1 | 120 | 0.2 | 6 | 1.4 | *1.3621* |
| 2 | 150 | 0.2 | 6 | 1.4 | ***1.8102\**** |
| 3 | 120 | 0.4 | 6 | 1.4 | *1.4506* |
| 4 | 150 | 0.4 | 6 | 1.4 | ***1.3068\**** |
| 5 | 120 | 0.2 | 10 | 1.4 | ***1.0823\**** |
| 6 | 150 | 0.2 | 10 | 1.4 | *1.1847* |
| 7 | 120 | 0.4 | 10 | 1.4 | *1.5409* |
| 8 | 150 | 0.4 | 10 | 1.4 | *1.3471* |
| 9 | 120 | 0.2 | 6 | 3.6 | *1.2971* |
| 10 | 150 | 0.2 | 6 | 3.6 | *1.5510* |
| 11 | 120 | 0.4 | 6 | 3.6 | *1.8754* |
| 12 | 150 | 0.4 | 6 | 3.6 | *1.8842* |
| 13 | 120 | 0.2 | 10 | 3.6 | ***2.0447\**** |
| 14 | 150 | 0.2 | 10 | 3.6 | *1.3361* |
| 15 | 120 | 0.4 | 10 | 3.6 | *1.4575* |
| 16 | 150 | 0.4 | 10 | 3.6 | ***1.5057\**** |

\*Treatments chosen for the phosphate release experiments.

Table 4. Encapsulation efficiency for the systems tested.

|  |  |
| --- | --- |
| **Particle Size ( µm)** | **Encapsulation Efficiency** |
| 1.0823 | 88.38 % |
| 1.3068 | 90.29 % |
| 1.5057 | 89.37 % |
| 1.8102 | 91.08 % |
| 2.0447 | 92.67 % |