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 % |