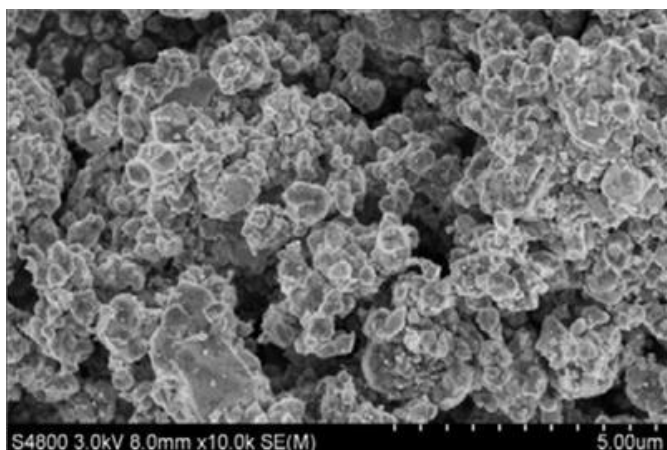


Contents

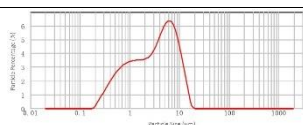

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1. LiFePO₄ (Lithium Iron Phosphate) Powder for Li-ion Battery Cathode, 150 g/bottle - Lib-LFPO-SX



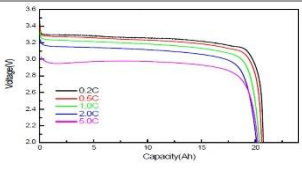
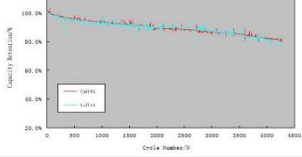
LiFePO₄ powder **coated by Carbon** with high cyclability for Li-ion battery cathode, 150 g/bottle, vacuum-sealed in a plastic bag.

Specifications:

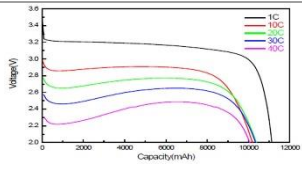
| Physical Properties | | |
|---|---------------------------|--|
| Particle Size | D10 (μm) | < 1.0 |
| | D50 (μm) | 3.5 ± 1.0 |
| | D90 (μm) | < 15 |
| Particle Size Distribution | |  |
| Tap Density (g/cm ³) | | 1.45 ± 0.2 |
| Packing Density (g/cm ³) | | ≥ 2.1 (2.2 - 2.3 recommended) |
| Specific Surface Area (m ² /g) | | 11.0 ± 2.0 |
| Moisture (%) | | < 0.15 |
| Chemical Compositions | C (%) | 1.15 ± 0.25 |
| | Li (%) | 4.40 ± 0.50 |
| | Fe (%) | 34.5 ± 1.0 |
| | P (%) | 19.5 ± 1.0 |
| | O (%) | 40.4 ± 0.50 |
| | impurity (Na, Ca, Ni) (%) | ≤ 0.01 |
| X-Ray Diffraction | |  |

Electro-Chemical Properties

20 Ah Pouch Cell with LFPO-S21 Cathode

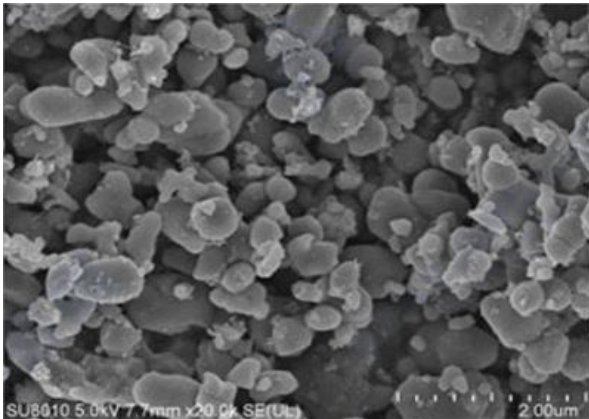
| | |
|--|--|
| Cathode Surface Density (g/m ²) | 300 |
| Cathode Packing Density (g/cm ³) | 2.3 |
| Internal Resistance (mΩ) | 1.44 |
| Efficiency at 0.1C First Cycle (%) | ≥ 90 |
| Specific Capacity at 0.1C First Cycle (mAh/g) | ≥ 150 |
| <p>Capacity versus Discharge Rate</p> <ul style="list-style-type: none"> Discharge Rate: 0.2C 0.5C 1C 2C 3C Capacity (mAh): 20738 20583 20369 20111 20229 Efficiency (%): 100.0 99.3 98.2 97.0 97.5 |  |
| Capacity versus Cycle Number |  |

10 Ah Pouch Cell (High Discharge Rate) with LFPO-S21 Cathode

| | |
|--|--|
| <p>Capacity versus Discharge Rate</p> <ul style="list-style-type: none"> Discharge Rate: 1C 10C 20C 30C 40C Capacity (mAh): 11127 10201 10393 10371 10088 Efficiency (%): 100.0 91.7 93.4 93.2 90.7 |  |
|--|--|

 **Safety Data Sheet SDS**

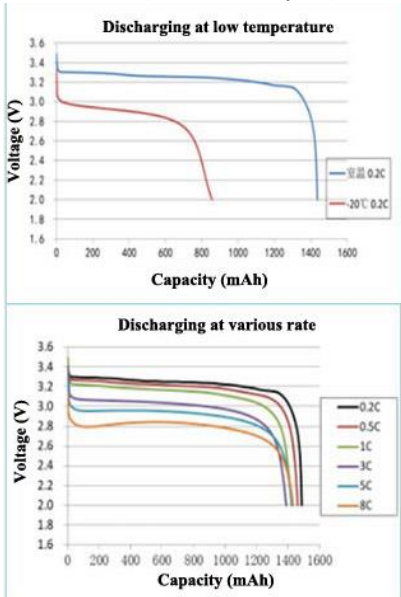
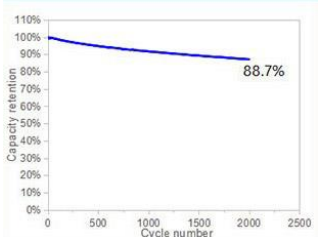

2. Single Crystal LiFePO₄ (Lithium Iron Phosphate) Powder for Li-ion Battery Cathode, 150 g/bottle - Lib-LFPO-SC



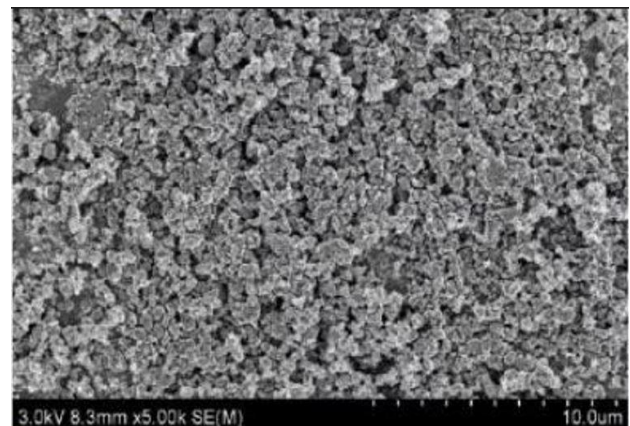
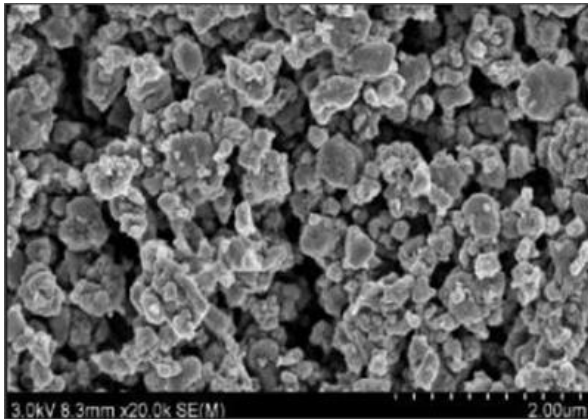
Single Crystal LiFePO₄ powder has advantages of high surface area, excellent cyclability, superior electrochemical performance at high/low temperature, high capacity and low resistance, therefore it has attracted wide attention in the fields of energy storage, electrical car, and other renewable energy applications.

Specifications:

| Physical Properties | | |
|--------------------------------------|----------|-------------------------------|
| Particle Size Distribution | D10 (μm) | ≥ 0.35 |
| | D50 (μm) | 0.6-1.8 |
| | D90 (μm) | ≤ 5.0 |
| | D97 (μm) | ≤ 10.0 |
| Appearance and Crystal Type | | Gray black, single crystal |
| Tap Density (g/cm ³) | | ≥ 0.75 |
| Packing Density (g/cm ³) | | ≥ 2.1 (2.2 - 2.3 recommended) |
| pH | | 8-10 |
| Moisture (ppm) | | ≤ 1000 |
| Carbon Content (%) | | 0.9-1.4 |

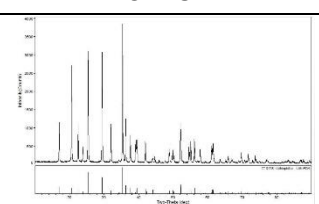
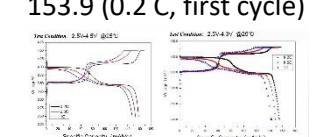
| | |
|---|---|
| <p>Discharge Capacity (mAh/g)</p> | <p>≥ 154 (0.1C, first cycle)</p>  |
| <p>Coulombic Efficiency (%)</p> | <p>≥ 95 (0.1C, first cycle)</p> |
| <p>Cyclability</p> |  |
| <p> Safety Data Sheet SDS</p> | |

3. $\text{LiMn}_{0.6}\text{Fe}_{0.4}\text{PO}_4$ (Lithium Manganese Iron Phosphate) Powder for Li-ion Battery Cathode, 150 g/bottle - Lib-LMFPO

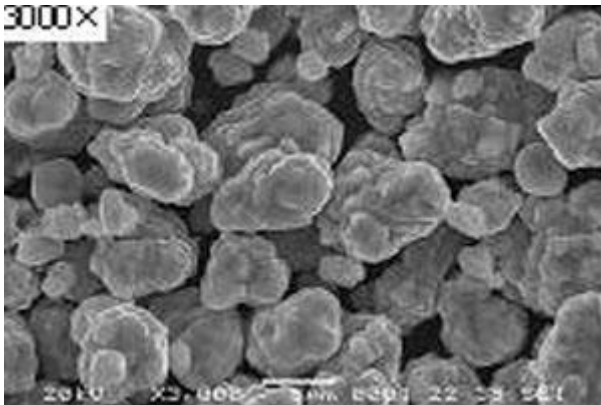


$\text{LiMn}_{0.6}\text{Fe}_{0.4}\text{PO}_4$ powder with **surface carbon coating** has the advantages of higher energy density, superior electrochemical performance at low temperatures, higher safety, and lower cost for Li-ion battery cathode compared to the LiFePO_4 counterpart. The LiFeMnPO_4 powder is vacuum-sealed in a plastic bag with 150g scale.

Specifications:

| Physical Properties | | |
|---|-----------------------|---|
| Particle Size | D10 (μm) | 0.346 |
| | D50 (μm) | 1.106 |
| | D90 (μm) | 9.088 |
| Powder Appearance | | Gray black, no agglomeration |
| Tap Density (g/cm^3) | | 0.97 |
| Specific Surface Area (m^2/g) | | 20.69 |
| Moisture (ppm) | | 836.8 |
| Chemical Composition (wt%) ($\text{LiFe}_{0.4}\text{Mn}_{0.6}\text{PO}_4$) | Li: 4.30 | |
| | Mn: 20.65 | |
| | Fe: 13.88 | |
| | P: 19.21, O: 40.09 | |
| | C: 1.87 | |
| X-ray Diffraction (XRD) | |  |
| Discharge Capacity (mAh/g) | | 153.9 (0.2 C, first cycle)  |
| Coulombic Efficiency (%) | | 92.78 (0.2 C, first cycle) |

4. LiCoO₂ Powder for Li-ion Battery Cathode, 200g/bag - EQ-Lib-LCO



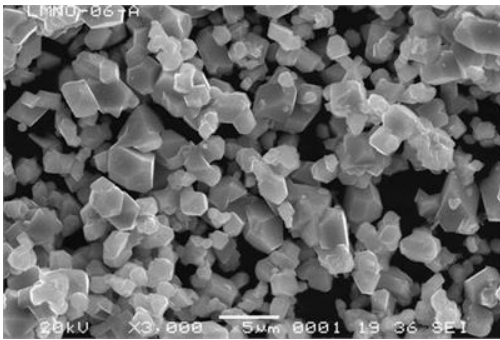
The LiCoO₂ powder with a **surface coating of single crystal aluminium** with excellent battery performance, such as high tape density, high voltage and capacity.

Specification:

| | | |
|--|--------------------|-------|
| Formula | LiCoO ₂ | |
| Package | 200 g/bag | |
| Appearance | Black Powder | |
| Size Distribution | D10 (µm) | 5.10 |
| | D50 (µm) | 15.30 |
| | D90 (µm) | 29.70 |
| Tap Density(g/cm ³) | 2.990 | |
| Specific Surface Area(m ² /g) | 0.150 | |
| pH | 9.95 | |
| Discharging Capacity at First Cycle (mAh/g) (vs. Li, 0.2C, 3.0-4.5 V) | 185.4 | |
| Columbic Efficiency at First Cycle of Charging/Discharging (%) | 94.70 | |
| Element Compositions | Li (%) | 7.02 |
| | Co (%) | 59.56 |
| | Fe (ppm) | 27.0 |
| | Ni (ppm) | 5.0 |
| | Na (ppm) | 43.0 |
| | Cu (ppm) | 1.0 |



5. LiMn2O4 (Manganese) Powder for Li-ion Battery Cathode, 200g/bag - EQ-Lib-LMO



LiMn2O4 Powder for Li-ion battery Cathode 200g/bag vacuum-sealed in a plastic bag

Application Notes:

1. Please click to see [Procedure for Preparing Anode & Cathode Electrode Slurry](#)
2. Please keep the powder in a vacuum box to avoid moisture,
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity

Reference: [A new active Li-Mn-O compound for high energy density Li-ion batteries. Nature Materials 15, 173–177 \(2016\)](#)

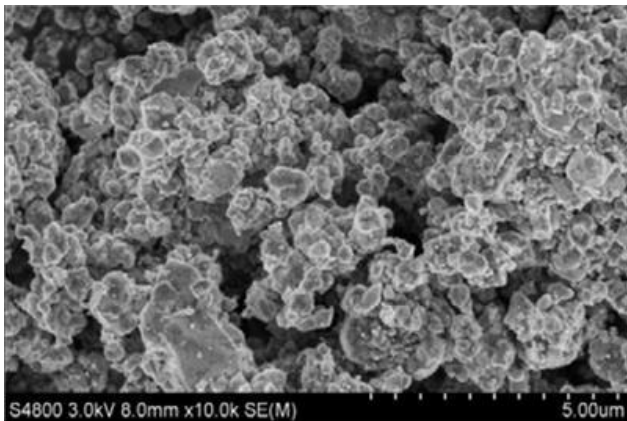


[Material Safety Data Sheet](#)

Specification:

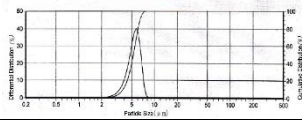
| Item | Unit | Content |
|------------------------|-------------------|---------|
| Main Composition | Li | % |
| | Mn | % |
| | Ni/Mn | % |
| Chemical Composition | Na | ppm |
| | K | ppm |
| | Ca | ppm |
| | Fe | ppm |
| | Cr | ppm |
| | Cu | ppm |
| Particle Distribution | D10 | μm |
| | D50 | μm |
| | D90 | μm |
| Specific Area | m ² /g | |
| pH value | | |
| Moisture | ppm | |
| Tap Density | g/cm ³ | |
| Compaction Density | g/cm ³ | |
| Specific Capacity | mAh/g | |
| First Cycle Efficiency | % | |


6. 5V LiNi_{0.5}Mn_{1.5}O₄ (LNMO) Cathode Powder (200 g/pack) for Next Generation Li-ion Batteries EQ-Lib-LNMO



Spinel-type LiNi_{0.5}Mn_{1.5}O₄ (LNMO) cathode material powder is attractive for next generation 5V lithium-ion batteries due to its high discharge plateau, good stability, and cycling performance.

Package: 200 g/pack in the vacuumed bag

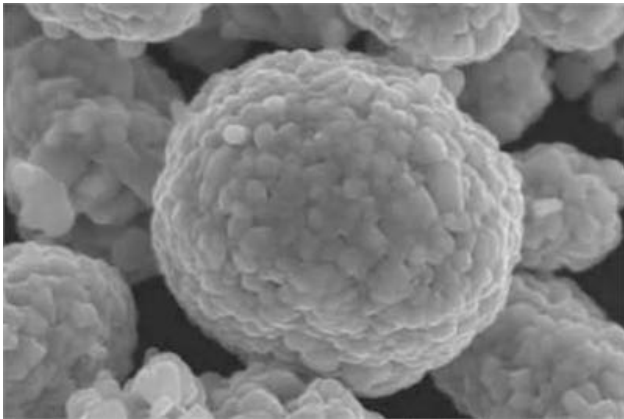
| Physical Properties | | |
|--|--|-----|
| Particle Size (Based on Laser Light Scattering) | D10 (µm) | 1.9 |
| | D50 (µm) | 3.8 |
| | D90 (µm) | 7.2 |
| Particle Size Distribution (Based on SEM) |  | |
| Specific Surface Area (m ² /g) | 0.92 | |
| pH | 9.62 | |
| Li+ (%) | 0.0015 | |

| Electrical Performance | |
|--|-----|
| Coulombic Efficiency for the first cycle (%) | 95 |
| Specific Capacity at the First Cycle (mAh/g) (Coin cell, vs Li, 0.1 C, 3-4.95V) | 140 |
|  Safety Data Sheet SDS | |

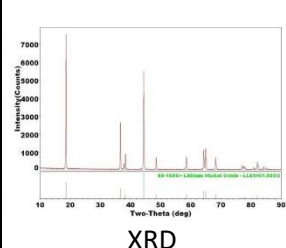
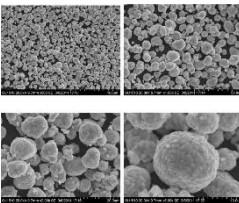

Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in the vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max capacity.

7. LiNiCoMnO₂ (Ni:Co:Mn=1:1:1) Powder for High Capacity Li-ion Battery Cathode, 200g/bag - EQ-Lib-LNCM111



LiNiCoMnO₂ (Lithium Nickel Manganese Cobalt Oxide) powder for Ultra-high capacity cylinder Li-ion power battery cathode 200g/bottle (Ni:Co:Mn=1:1:1)

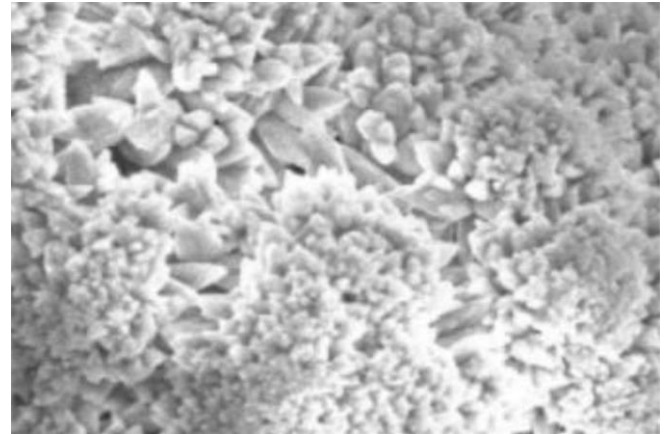
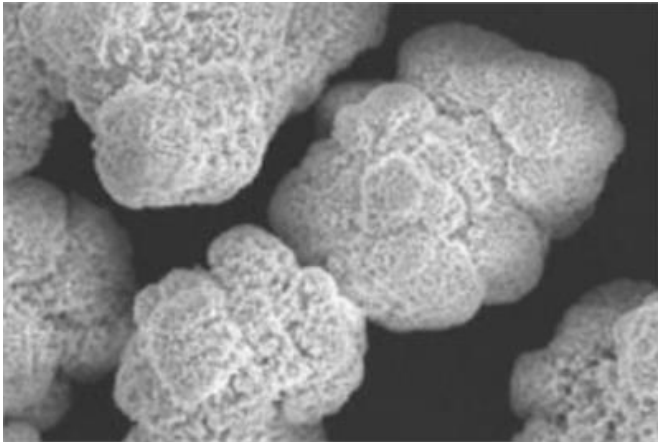
| Specification | | Item | Description | Testing Method |
|--|----------------------|--|--|----------------|
|  <p>XRD</p>  <p>SEM</p> <p> Safety Data Sheet SDS</p> | D ₁₀ (μm) | ≥3.0 | Laser Particle Size Analyzer | |
| | D ₅₀ (μm) | 5.0~7.5 | | |
| | D ₉₀ (μm) | ≤15.0 | | |
| | Appearance | Dark brown powder, atmospheric stability | | |
| | Elements Proportions | Ni:Co:Mn = 1:1:1 | | |
| | Ni+Co+Mn (%) | 60.0±2.0 | Volumetry | |
| | Li (%) | 7.3±0.3 | Atomic Absorption Spectroscopy Inductively Coupled Plasma | |
| | Na (ppm) | ≤300 | | |
| | K (ppm) | ≤100 | | |
| | Ca(ppm) | ≤200 | | |
| Fe (ppm) | ≤100 | | | |
| Mg (ppm) | ≤200 | | | |
| Cu (ppm) | ≤10 | | | |
| Specific Surface Area (m ² /g) | 0.20-0.40 | Surface Area and Porosity | | |
| pH value | 10.80~11.40 | PH Tester | | |
| Humidity | ≤0.05 % | Coulometric KF Titrator | | |
| Tap Density (g/cm ³) | ≥2.10 | Tap Density Tester | | |
| Compaction Density (g/cm ³) | ≥3.30 | | | |
| First Discharge Capacity (mAh/g) | ≥152.0 | 0.2C, 4.2-2.7V, Vs Li, Half Cell | | |

| | | | |
|--|--------------------------------|-------|--|
| | First Discharge Efficiency (%) | ≥86.0 | |
| | | | |

Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in the vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.

8. Manganese-rich $\text{Li}_{1.2}\text{Ni}_{0.13}\text{Co}_{0.13}\text{Mn}_{0.54}\text{O}_2$ Powder for Li-Ion Battery Cathode, 100g/bottle, Lib-LNCM114



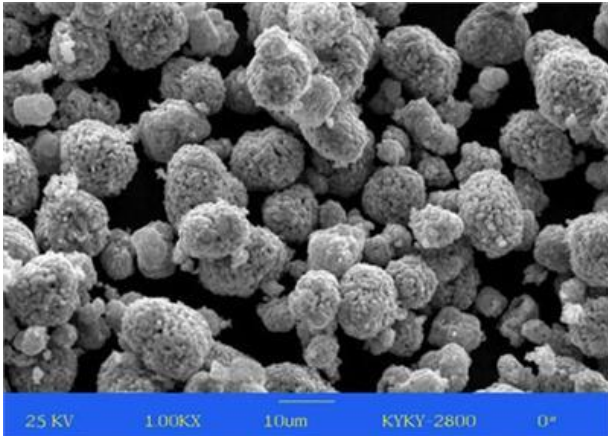
Manganese-rich $\text{Li}_{1.2}\text{Ni}_{0.13}\text{Co}_{0.13}\text{Mn}_{0.54}\text{O}_2$ (LNCM) powder for Li-ion battery cathode, 100g/bottle

| Properties | Item | Unit | Standard Value | Description |
|-------------------------------------|------|-------------------|----------------|---------------------|
| Chemical Composition | Ni | % | 16.6±0.5 | 16.07 |
| | Mn | % | 66.6±1.5 | 65.92 |
| | Co | % | 16.6±0.5 | 16.81 |
| Impurities | Fe | ppm | ≤100 | 20.53 |
| | Ca | ppm | ≤300 | 58.07 |
| | Na | ppm | ≤500 | 116.21 |
| | Cu | ppm | ≤50 | / |
| Size Distribution | D10 | μm | ≥5 | 6.11 |
| | D50 | μm | 10-13 | 9.86 |
| | D90 | μm | ≤30 | 12.5 |
| | Dmax | μm | ≤50 | 17.2 |
| pH Value | | / | ≤11.2 | / |
| Specific Surface Area | | m ² /g | 1-10 | / |
| Humidity | | ppm | < 500 | / |
| Tap Density | | g/cm ³ | ≥1.21 | / |
| First Discharge Capacity (3.0-5.0V) | | mAh/g | ≥230 | 289(0.1C), 230 (1C) |
| First Efficiency | | % | ≥84 | / |

Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in the vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.

9. LiNiCoMnO₂ (Ni:Co:Mn=5:2:3) Powder for High Power Li-ion Battery Cathode 200g/bottle - EQ-Lib-LNCM523



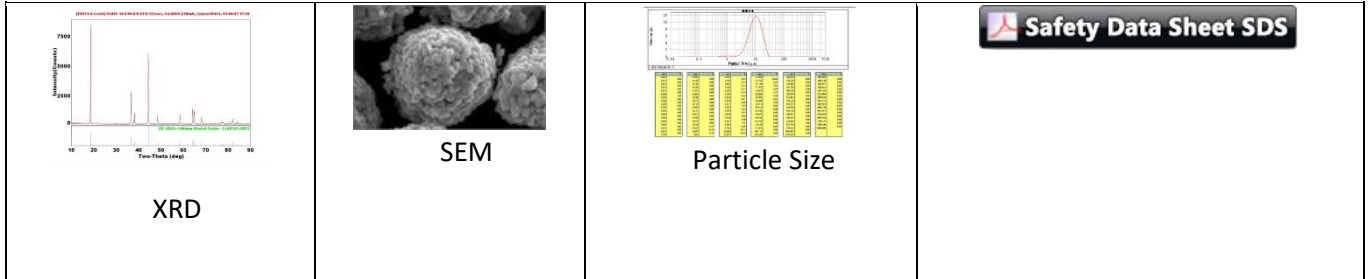
LiNiCoMnO₂ (Lithium Nickel Manganese Cobalt Oxide) powder for Li-ion power battery cathode 200g/bottle (Ni:Co:Mn=5:2:3)

Specification:

| Item | Description | Testing Method |
|---|--|--|
| D ₁₀ (μm) | ≤ 5.0 | Laser Particle Size Analyzer |
| D ₅₀ (μm) | 10.0-14.0 | |
| D ₉₀ (μm) | ≥25.0 | |
| Appearance | Dark brown powder, atmospheric stability | |
| Elements Proportions | Ni:Co:Mn = 5:2:3 | |
| Ni+Co+Mn (%) | ≥58 | Volumetry |
| Li (%) | 7.00-8.00 | Atomic Absorption Spectroscopy Inductively Coupled Plasma |
| Fe (%) | ≤0.01 | |
| Na (%) | ≤0.03 | |
| Cu (%) | ≤0.005 | |
| H ₂ O (%) | ≤0.05 | Coulometric KF Titrator |
| PH | ≤ 11.50 | PH Tester |
| H ₂ O (%) | ≤ 0.1 | Moisture Analyzer |
| Specific Surface Area (m ² /g) | 0.20-0.40 | BET Analyzer |
| Specific Capacity (mAh/g) [1st cycle] | 153-158 | 0.2C, 4.2-2.7 V vs Li/Li+, Half Cell |

Columbia Efficiency (%) [1st cycle]

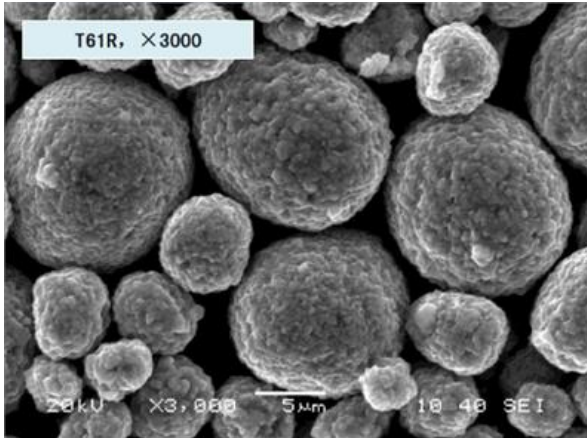
≥85%



Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in vacuum box to avoid moisture.
3. **Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.**

10. LiNiCoMnO₂ (Ni:Co:Mn=6:2:2) Powder for High Power Li-ion Battery Cathode, 200g/bottle-EQ-Lib-LNCM622

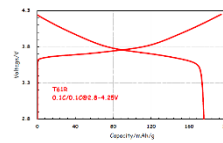


LiNiCoMnO₂ (Lithium Nickel Manganese Cobalt Oxide) powder for Li-ion battery cathode, 200g/bottle (Ni:Co:Mn=6:2:2).

Specification

| Properties | Item | Measured Value | Standard Value | |
|---|--|----------------|----------------|----|
| Chemical Composition | Li (Wt%) | 7.2±0.6 | 7.4 | |
| | Ni+Co+Mn (Wt%) | 59.0±1.0 | 58.6 | |
| | Impurities | Na (ppm) | ≤100 | 20 |
| | | Fe (ppm) | ≤100 | 30 |
| Cu (ppm) | | ≤50 | 1 | |
| Size Distribution | D10 (μm) | ≥5.0 | 6.6 | |
| | D ₅₀ (μm) | 11±2 | 11.0 | |
| | D ₉₀ (μm) | ≤28 | 18 | |
| | D _{max} (μm) | ≤45 | 28.9 | |
| Specific Surface Area (m ² /g) | | 0.35±0.15 | 0.27 | |
| Tap Density (g/cm ³) | | ≥2.1 | 2.65 | |
| Moisture (ppm) | | ≤400 | 300 | |
| pH | | 11.0~12.0 | 11.56 | |
| Electrochemical Properties | First discharge specific capacity (2032 coin battery, 0.1C/0.1C, 2.8-4.25V, mAh/g) | ≥5.0 | 176.0 | |
| | First charge and discharge efficiency (%) | ≥85.0 | 89 | |

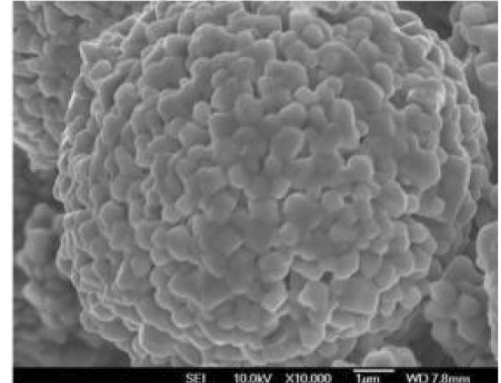
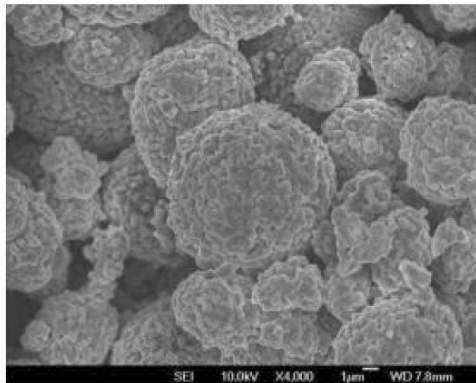
Charge & Discharge Plot



Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.

11. LiNiCoMnO₂ (Ni:Co:Mn=8:1:1) Powder for Li-ion Battery 200g/bag - EQ-Lib-LNCM811



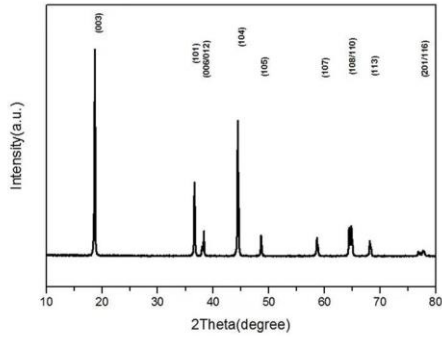
LiNiCoMnO₂ (Lithium Nickel Manganese Cobalt Oxide) powder for efficient and stable Li-ion battery cathode. **Boron was surface coated on NMC811 powder to lower the resistance and increase charging/discharging cyclicality (Since Oct, 2023).**

Specification

| Item | Standard Value | Typical Value |
|--|-------------------------------|------------------------|
| D ₁₀ (µm) | ~5.0 | 5.59 |
| D ₅₀ (µm) | 9 ~ 15 | 10.80 |
| D ₉₀ (µm) | <30 | 17.90 |
| D _{max} (µm) | <45 | 23.30 |
| Specific Surface Area (m ² /g) | 0.25 - 0.65 m ² /g | 0.55 m ² /g |
| Tap Density (g/cm ³) | >2.1 g/cm ³ | 2.3 g/cm ³ |
| pH | 11.5 - 12.0 | 11.7 |
| Moisture (%) | ≤0.04 | 0.02 |
| Ni + Mn + Co (wt%) | 58.0 - 60.5 | 58.81 |
| Li (wt%) | 7.1 - 7.6 | 7.30 |
| Fe (wt%) | <0.0050 | 0.005 |
| Cu (wt%) | <0.0020 | 0.001 |
| Ca (wt%) | <0.0100 | 0.0017 |
| Na (wt%) | <0.0300 | 0.0045 |
| Zn (wt%) | <0.0200 | 0.0004 |
| Half-cell Charge Specific Capacity (2.8-4.3V, 0.1C) (mAh/g) | >230 | 235 |
| Half-cell Discharge Specific Capacity (2.8-4.3V, 0.1C) (mAh/g) | >210 | 215 |
| First Discharge efficiency (2.8-4.3V) | >90% | 91.5% |
| Micromorphology | Powdery particles | |

Appearance

Black powder, uniform color, no noise, no agglomeration



 **Safety Data Sheet SDS**

Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in the vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.

12. LiNiCoMnO₂ (Ni:Co:Mn=9: 0.5: 0.5) Powder for Li-ion Battery Cathode, 200g/bottle - Lib-LNCM911



Nickel-rich LiNiCoMnO₂ (Lithium Nickel Cobalt Manganese Oxide, Ni:Co:Mn = 9:0.5:0.5) with advantages of higher energy density and lower cost, has attracted great attention in Li-ion battery compared to the LiCoO₂ counterpart. Simultaneously, the Ni-rich NMC is good for the study of degradation mechanisms during charging/discharging processes.

Specification

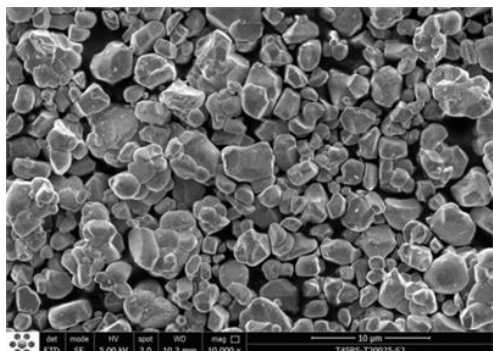
| Properties | Item | Standard Value |
|---------------------------|-------------------------------|----------------|
| Crystal Type | Polycrystalline | |
| Chemical Composition | Ni (mol%) | 90.0 ± 0.5 |
| | Co (mol%) | 5.0 ± 0.5 |
| | Mn (mol%) | 5.0 ± 0.5 |
| Size Distribution | D ₅₀ (µm) | 12.0 ± 1.0 |
| Impurities (wt%) | OH ⁻ | ≤0.30 |
| | CO ₃ ²⁻ | ≤0.20 |
| Specific Capacity (mAh/g) | 217 ± 3 | |
| Coulombic Efficiency (%) | 89 ± 1 (first cycle) | |



Application Notes:

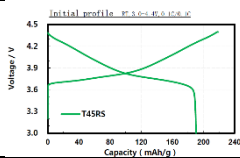
1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in the vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.

13. Single Crystal Powder of LiNiCoMnO₂ (Ni:Co:Mn=6:1:3) Powder for Li-ion Battery Cathode, 200g/bottle - Lib-LNCM613-SC



Single Crystal LiNiCoMnO₂ (Lithium Nickel Manganese Cobalt Oxide, Ni:Co:Mn=6:1:3) with an electrochemomechanically compliant microstructures has attracted great attention in Li-ion battery for its superior electrochemical performance compared to the polycrystalline counterpart

Specification

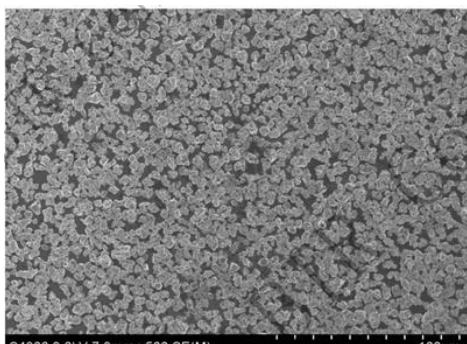
| Properties | Item | Standard Value |
|---|--|----------------|
| Chemical Composition | Ni (mol%) | 60.0 |
| | Co (mol%) | 10.0 |
| | Mn (mol%) | 30.0 |
| Size Distribution | D ₁₀ (μm) | 1.8 |
| | D ₅₀ (μm) | 3.5 |
| | D ₉₀ (μm) | 6.3 |
| Specific Surface Area (m ² /g) | | 0.84 |
| Tap Density (g/cm ³) | | 2.50 |
| Moisture (ppm) | | 219 |
| pH | | 11.56 |
| Electrochemical Properties | First discharge specific capacity (2032 coin battery, 0.1C/0.1C, 2.8-4.25V, mAh/g) | 190.8 |
| | First charge and discharge efficiency (%) | 87 |
| Charge & Discharge Graph |  | |

Safety Data Sheet SDS

Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in the vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.

14. Single Crystal Powder: LiNiCoMnO₂ (Ni:Co:Mn=8:1:1) Powder for Li-ion Battery Cathode, 200g/bottle - Lib-LNCM811-SC



Single Crystal LiNiCoMnO₂ (Lithium Nickel Manganese Cobalt Oxide, Ni:Co:Mn=8:1:1) with an electrochemomechanically compliant microstructures has attracted great attention in Li-ion battery for its superior electrochemical performance compared to the polycrystalline counterpart

Specification

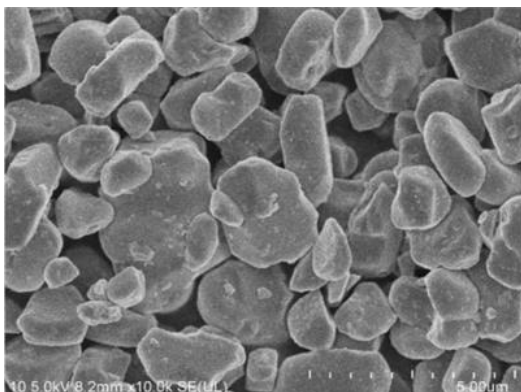
| Properties | Item | Standard Value | Typical Value |
|---|---------------------------------------|----------------|---------------|
| Chemical Composition | Ni (mol%) | 83.0 ± 0.5 | 82.8% |
| | Co (mol%) | 11.0 ± 0.5 | 10.9% |
| | Mn (mol%) | 6.0 ± 0.5 | 6.2% |
| Size Distribution | D ₁₀ (µm) | ≥ 1.8 | 2.4 |
| | D ₅₀ (µm) | 4.0±0.5 | 4.4 |
| | D ₉₀ (µm) | ≤ 14 | 11.6 |
| Specific Surface Area (m ² /g) | BET | 0.70 ± 0.15 | 0.79 |
| Tap Density (g/cm ³) | | ≥ 1.8 | 2.22 |
| Moisture (ppm) | | ≤ 500 | 281 |
| pH | | 11.0 ± 0.50 | 11.44 |
| Residual | Li ₂ CO ₃ (wt%) | ≤ 0.20 | 0.177 |
| | LiOH (wt%) | ≤ 0.25 | 0.150 |
| | Li (ppm) | ≤ 7.30 | 7.39 |
| Impurities | Fe (ppm) | ≤ 50 | 21 |
| | Cu (ppm) | ≤ 20 | 2 |
| | Na (ppm) | ≤ 350 | 13 |
| | S (ppm) | ≤ 2500 | 260 |
| Specific Capacity (3.0-4.25 V) (mAh/g) | 0.3 C | | 195.8 |
| | 1 C | | 185.6 |

Safety Data Sheet SDS

Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in the vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.

15. Single Crystal LiNiCoMnO₂ (Ni:Co:Mn=9: 0.5: 0.5) Powder for Li-ion Battery Cathode, 200g/bottle - Lib-LNCM911-SC



Single Crystal LiNiCoMnO₂ (Lithium Nickel Manganese Cobalt Oxide, Ni:Co:Mn=9:0.5:0.5) with advantages of high tape density, long cyclability, high specific capacity, and excellent electrochemical performance consistency, has attracted great attention in Li-ion battery compared to the polycrystalline counterpart

Specification

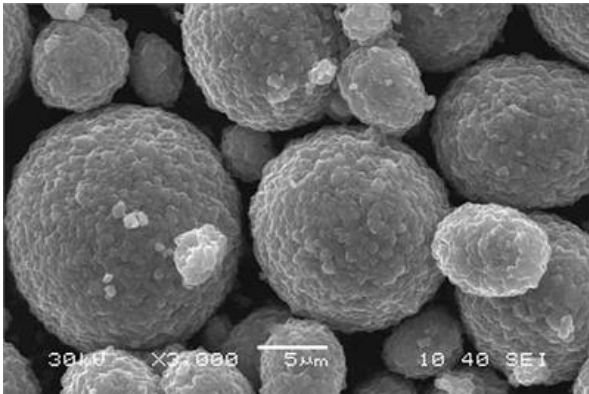
| Properties | Item | Standard Value |
|---------------------------|-----------------------------------|----------------|
| Chemical Composition | Ni (mol%) | 90.0 ± 0.5 |
| | Co (mol%) | 5.0 ± 0.5 |
| | Mn (mol%) | 5.0 ± 0.5 |
| Size Distribution | D ₅₀ (μm) | 3.5 ± 1.0 |
| Impurities (wt%) | OH ⁻ | ≤0.30 |
| | CO ₃ ²⁻ | ≤0.20 |
| Specific Capacity (mAh/g) | 214 ± 3 (room temperature, 25 °C) | |
| Coulombic Efficiency (%) | 87 ± 1 (first cycle) | |

Safety Data Sheet SDS

Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in the vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.

16. LiNiCoAlO₂ (Ni:Co:Al=8.15:1.5:0.35) Powder for High Power Li-ion Battery Cathode 200g/bottle - Lib-LNCA810



LiNiCoAlO₂ (Lithium Nickel Cobalt Aluminum Oxide) powder for Li-ion power battery cathode 200g/bottle (Ni:Co:Al =8.15:1.5:0.35)

Specification

| Item | Description | |
|---|--|---|
| Composition | Li (NiCoAl) O ₂ Ni:Co:Al=8.15:1.5:0.35 | Li = (7.2 ± 0.4)% Ni+Co+Al = (59.0 ± 1.0)% |
| D ₁₀ (μm) | 7.3 | |
| D ₅₀ (μm) | 13.6 | |
| D ₉₀ (μm) | 26.8 | |
| D _{max} (μm) | 39.9 | |
| Moisture | 380 | |
| pH | 11.7 | |
| Li ₂ CO ₃ (%) | 0.32 | |
| LiOH (%) | 0.11 | |
| Fe (ppm) | ≤100 ppm | |
| Na (ppm) | ≤200 ppm | |
| Cu (ppm) | ≤20 ppm | |
| | | |
| Specific Surface Area (m ² /g) | 0.5 | BET Analyzer |

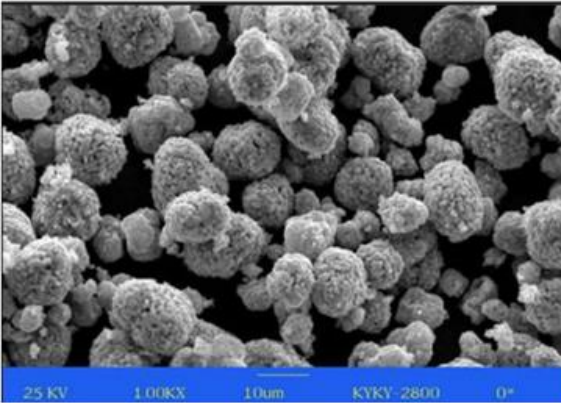
| | | |
|--|-------|-------------|
| Tapped Density (g/cm ³) | 2.40 | |
| Discharge Capacity (3.0-4.3V) (mAh/g) | 195.7 | @ 0.1C |
| Discharge Rate (%) | 90.0 | @2C vs.0.2C |
| Capacity Retention (RT, 3.0-4.3V, 1C/1C) (%) | 92.3 | 1C@51cls |



Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.

17. Precursor Powder of NCMOH622 for High Capacity NCM Cathode Powder 200g/bottle - Lib-PNCM622



Lib-PNCM622 is the precursor powder of NCMOH622 for High Capacity NCM Cathode Powder at your own composition.

There are 200 grams in one bottle

Note: You must mix the precursor with LiOH. H2O and calcine the mixed powder at 750- 790oC before use

| Specification | | | |
|----------------------------|---|------------------------|------------------|
| Package | 200g/bottle in a vacuumed bag | | |
| Composition | NCMOH622 (Ni:Co:Mn = 6.503 : 1.569: 1.928) | | |
| Configuration | Sphere | | |
| Particle size distribution | D10 : 4.33 μm D50 : 9.89 μm D90 : 18.22 μm | | |
| Specific surface area | 4.09 m^2/g | | |
| Tap Density | $\geq 1.64 \text{ g/cm}^3$ | | |
| Water Content | wt% < 0.36 | | |
| PPH value | ~ 8.05 | | |
| | Main Element | Required Content (mol) | Ratio (Ni:Co:Mn) |
| | Li | 0 | 0 |
| | Ni | 40.0528 | 6.503 |
| | Co | 9.6601 | 1.569 |

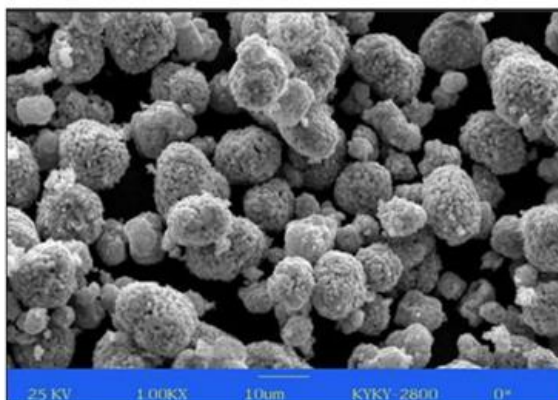
| | | | |
|--|----------|----------------|---------------|
| | Mn | 11.8743 | 1.928 |
| | Impurity | Required (ppm) | Typical (ppm) |
| | Ca | <300 | 18 |
| | Cu | <50 | 8 |
| | Fe | <100 | 18 |
| | Mg | <300 | 19 |
| | Na | <500 | 232 |
| | Zn | <100 | 102 |
| | SO4 | <5000 | 3300 |



Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry.](#)
2. Please keep the powder in a vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.

18. Precursor Powder of NCMOH811 for High Capacity NCM Cathode Powder 200g/bottle - EQ-Lib-PNCM811



Lib-PNCM811 is the precursor powder of NCMOH811 for High Capacity NCM Cathode Powder at your own composition.

There are 200 grams in one bottle

Note: You must mix the precursor with LiOH. H2O and calcine the mixed powder at 750- 790oC before use

| Specification | | | |
|----------------------------|--|------------------------|-------------------|
| Package | 200g/bottle in a vacuumed bag | | |
| Composition | NCMOH811 | | |
| Configuration | Sphere | | |
| Particle size distribution | D10 : 5.36 μm D50 : 11 μm D90 : 18.6 μm | | |
| Magnetic substance | 102 ppd | | |
| Tap Density | $\geq 1.74 \text{ g/cm}^3$ | | |
| Water Content | wt% < 0.5 | | |
| PH value | ~ 8.38 | | |
| | Mian Element | Required Content (mol) | Ratio (Ni:Co: Mn) |
| | Li | 0 | 0 |
| | Ni | 47.7247 | 7.994 |
| | Co | 6.3195 | 1.059 |
| | Mn | 5.6562 | 0.947 |
| | Impurity | Required (ppm) | Typical (ppm) |

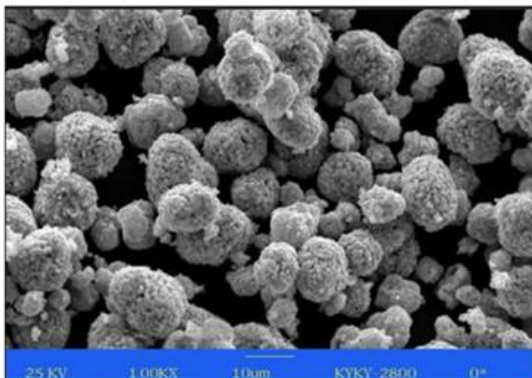
| | | | |
|--|-----|-------|------|
| | Ca | <300 | 16 |
| | Cu | <50 | 1 |
| | Fe | <100 | 15 |
| | Mg | <300 | 2 |
| | Na | <500 | 229 |
| | Zn | <100 | 121 |
| | SO4 | <5000 | 3000 |



Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in a vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.

19. Precursor Powder of NCMOH2 (Ni:Co:Mn = 9:0.5:0.5) for High Capacity NCM Cathode Powder, 200g/bottle - Lib-PNCM911



Lib-PNCM911 is the precursor powder of NCMOH with Ni:Co:Mn = 9 : 0.5: 0.5 for High Capacity NCM Cathode Powder.

There are 200 grams in one bottle

Note: You must mix the precursor with LiOH. H2O and calcine the mixed powder at 750- 790 °C before use

| Specification | | | |
|----------------------------|---|-------------------------|-------------------------|
| Package | 200g/bottle in a vacuumed bag | | |
| Composition | NCMOH (Ni:Co:Mn = 9 : 0.5: 0.5) | | |
| Configuration | Sphere | | |
| Particle Size Distribution | D10 : 11.32 μ m D50 : 13.51 μ m D90 : 16.12 μ m | | |
| Tap Density | 2.06 g/cm ³ | | |
| | Main Element | Standard Content (mol%) | Measured Content (mol%) |
| Chemical Composition | Ni | 90.00 \pm 1 | 90.11 |
| | Co | 5 \pm 1 | 5.92 |
| | Mn | 5 \pm 1 | 3.98 |
| | Impurity | Standard Content (ppm) | Measured Content (ppm) |
| | Fe | <3 | 2 |
| | Ca | <8 | 7 |
| | Mg | <8 | 7 |

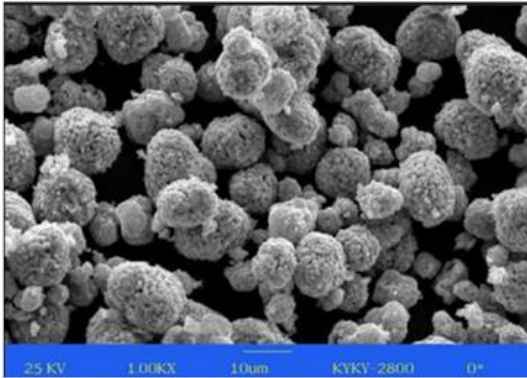
| | | | |
|--|-----|------|------|
| | Cu | <2 | 0 |
| | Na | <500 | 351 |
| | H2O | - | 3700 |



Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry.](#)
2. Please keep the powder in a vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.

20. Precursor Powder of (Ni_{0.8}Co_{0.15}Al_{0.05}(OH)₂ for DIY High Capacity Li-Ion Battery Cathode Powder 200g/bottle - EQ-Lib-Pre-NCA



EQ-Lib-Pre-NCA is the precursor of NCA (Ni_{0.8}Co_{0.15}Al_{0.05}(OH)₂) for DIY Li--NCA cathode powder for high capacity Li-Ion cathode at your own composition.

Note: You must mix the precursor with LiOH, H₂O and calcine the mixed powder at 750- 790oC before use

| Specification | | | |
|----------------------------|---|------------------|------------------|
| Package | 200g/bottle in a vacuumed bag | | |
| Composition | Ni _{0.8} Co _{0.15} Al _{0.05} (OH) ₂ | | |
| Configuration | Sphere | | |
| Particle size distribution | D10 : 5±0.5µm D50 : 13-18µm D90 : 30±0.5µm | | |
| Specific surface area | ~1.5m ² /g | | |
| Tap Density | ≥1.8g/cm ³ | | |
| Water Content | <500ppm | | |
| PPH value | ≤11.2 | | |
| | Mian Element | Required Content | Real Content (%) |
| | Li | 0 | 0 |
| | Ni | 80±0.5 | 80.07 |
| | Co | 15±0.5 | 15.10 |

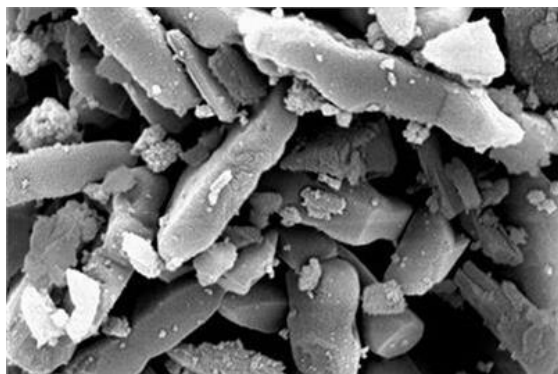
| | | | |
|--|----------|----------------|---------------|
| | Al | 5±0.5 | 4.77 |
| | Impurity | Required (ppm) | Typical (ppm) |
| | Ca | <300 | 49.58 |
| | Cu | <50 | ND |
| | Fe | <100 | 96.34 |
| | Cr | <50 | 27.51 |
| | Mg | <300 | 44.56 |
| | Na | <500 | 119.85 |
| | S | <2000 | 391.5 |
| | Zn | <100 | 4.19 |
| | Mn | <100 | 29.98 |
| | Si | <300 | 75.23 |
| | Zr | <5000 | 390.0 |
| | Y | <250 | 170.12 |

 **Safety Data Sheet SDS**

Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in a vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.

21. Li₂CO₃ (Carbonate) Powder for Li-ion Battery Cathode, 200g/bottle - EQ-Lib-LCN



Li₂CO₃ powder for Li-ion battery cathode also as good material for preparing [LiFePO₄](#)

Specifications:

- Formula: Li₂CO₃, Lithium Carbonate
- Appearance: White Powder
- Molecular Weight : 73.89
- Specific Weight: 2.11
- Melting Point: 723°C
- Boiling Point: 1230°C
- Solubility: Slightly Soluble in water, insoluble in alcohol, acetone or liquid ammonia
- [SDS](#)

| Item | | Description |
|-------------------------------------|-------------------------------|-------------|
| Li ₂ CO ₃ (%) | | 99.5 |
| Impurity (ppm) | Na | 250 |
| | K | 10 |
| | Fe | 20 |
| | Ca | 50 |
| | Cu | 10 |
| | Pb | 10 |
| | Ni | 30 |
| | Mn | 10 |
| | Zn | 10 |
| | Al | 50 |
| | Mg | 100 |
| | Si | 50 |
| | SO ₄ ²⁻ | 800 |
| Cl ⁻ | 50 | |
| H ₂ O (%) | | 0.40 |
| Average Grain Size (um) | | <6 |

Application Notes:

1. Please click to see Procedure for [Preparing Anode & Cathode Electrode Slurry](#).
2. Please keep the powder in vacuum box to avoid moisture.
3. Please bake the powder in a vacuum oven at 120 - 150 °C before making slurry and coating to ensure max. capacity.