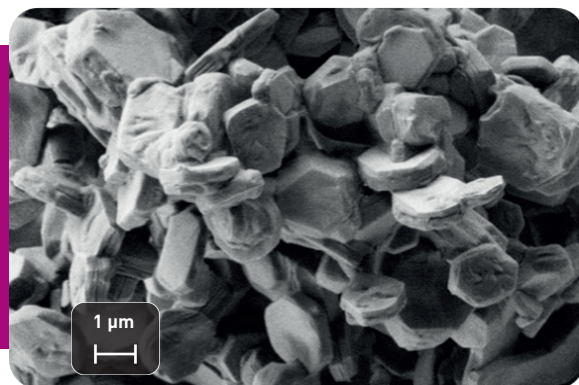


# IBUvolt® NMO



SEM of IBUvolt® NMO

## CHEMICAL & PHYSICAL PROPERTIES

| ITEM                        | UNIT                 | SPECIFICATION                          | TESTING METHOD               |
|-----------------------------|----------------------|--|------------------------------|
| Na                          | (wt.-%)              | 14 - 16                                | ICP-OES                      |
| Mn                          | (wt.-%)              | 48 - 51                                | ICP-OES                      |
| Specific surface area (BET) | (m <sup>2</sup> /g)  | 1 - 2                                  | N <sub>2</sub> Physisorption |
| Crystal structure           |                      | P2, Na <sub>0.7</sub> MnO <sub>2</sub> | X-ray diffraction            |
| Tapped density              | (g/cm <sup>3</sup> ) | 1 - 1.4                                | Tapped density tester        |
| PSD, d10                    | (μm)                 | 1 - 3                                  | Laser diffraction            |
| PSD, d50                    |                      | 2 - 5                                  | Laser diffraction            |
| PSD, d90                    |                      | 7 - 12                                 | Laser diffraction            |
| PSD, d99                    |                      | < 40                                   | Laser diffraction            |

## CAPACITY TESTS (COIN CELLS)

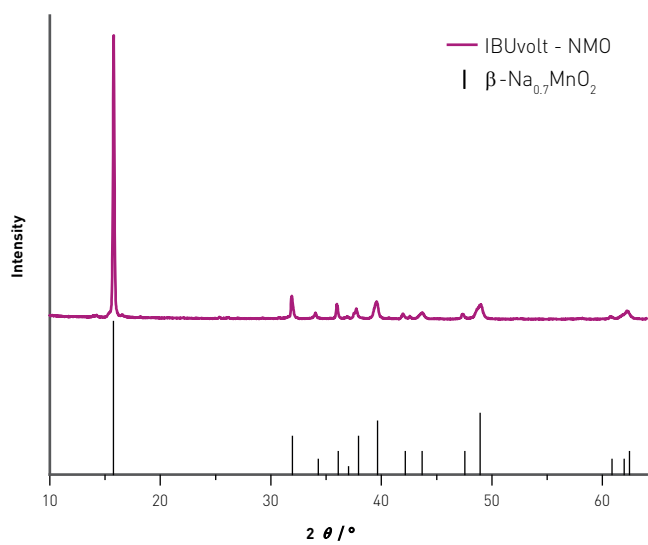
| ITEM                                     | UNIT    | TYPICAL VALUE | SPECIFICATION |
|--|---------|---------------|---------------|
| Specific capacity 0.1 C*                 | (mAh/g) | 155           | ≥ 150         |
| Coulomb efficiency 2 <sup>nd</sup> cycle | (%)     | > 98          |               |

\*Half cells, 26 °C, 3 mg/cm<sup>2</sup>, PC|FEC|NaClO<sub>4</sub>, 2<sup>nd</sup> cycle discharge CC 4.4 - 2.0 V

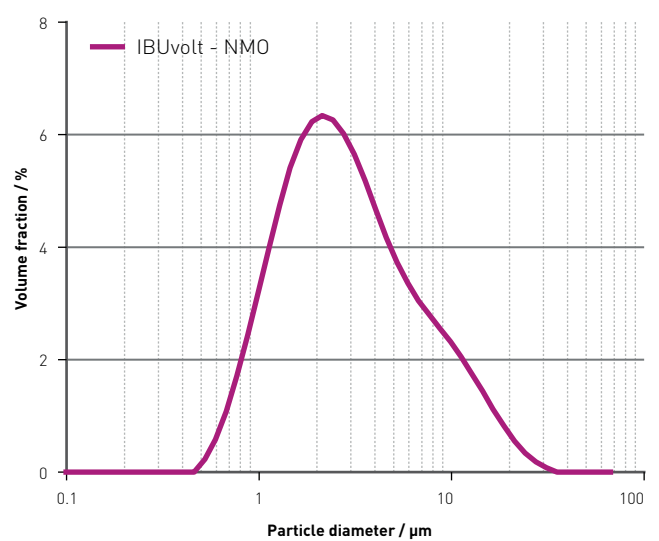
# IBUvolt®

## NMO

### CHEMICAL & PHYSICAL CHARACTERIZATION

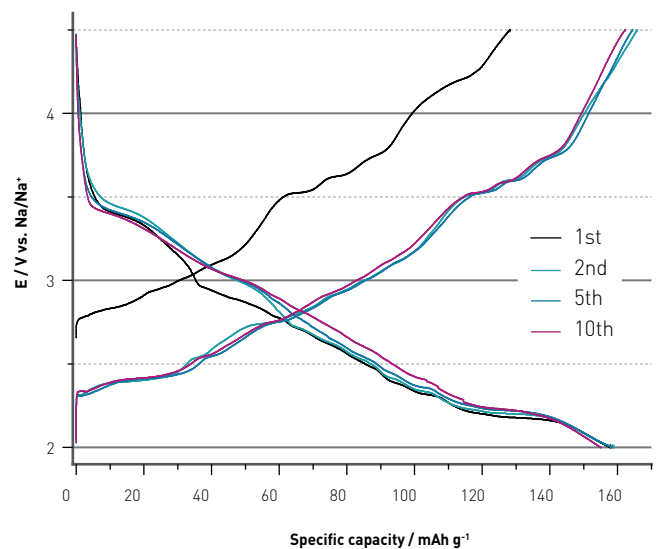
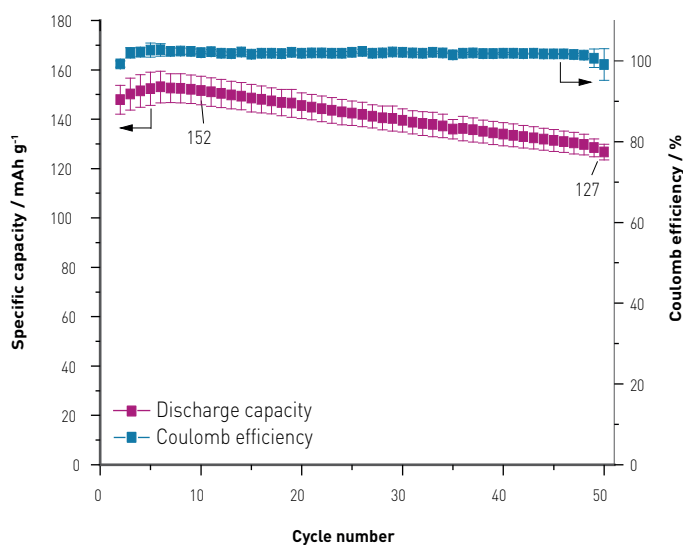


Powder X-ray Diffractogramm



Particle Size Distribution

### ELECTROCHEMICAL CHARACTERIZATION (COIN CELLS)



Discharge Capacity and Coulomb Efficiency over 50 Cycles (left) and Voltage-Capacity Curve (right)

Half Cell, 26°C, 0.1C, sodium anode, 1M NaClO<sub>4</sub>/PC/FEC electrolyte