



新型鋰離子電池正極材料製備方法

(以下內容一頁為限，不可揭露關鍵技術內容；填表完成後請刪除此行)

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市場及需求：

本技術係關於一種合成鋰離子電池正極材料 $\text{LiNi}_{1-x-y}\text{Co}_x\text{Mn}_y\text{O}_2$ ，一種適用於電動車長期穩定使用之材料。與傳統的電池技術相比，鋰離子電池充電速度更快、使用更持久，並且具有更高的功率密度，能以輕巧的體積提供更長效的電池續航力。本技術製備之鋰離子電池正極材料 $\text{LiNi}_{1-x-y}\text{Co}_x\text{Mn}_y\text{O}_2$ ，以天然洋菜粉為螯合劑控制 $\text{LiNi}_{1-x-y}\text{Co}_x\text{Mn}_y\text{O}_2$ 粉體形貌及粒徑，可有效提高電池電容量且增加電池長期使用之穩定性，符合電動車的市場需求。

技術摘要(含成果)：

本技術係一種鋰離子電池層狀結構正極材料之製備方法，可降低反應溫度，控制粉體外貌及粒徑。鋰離子電池電容量及循環壽命可以被改善。此種正極材料合適應用於可再生能源科技及電動車產業。

優勢：

本技術利用天然洋菜做為螯合劑，製備高結晶性鋰離子電池正極材料。透過本新型技術可製備出具有特殊形貌之正極材料粉體，並進一步降低反應溫度。電池測試結果顯示出良好的電池電容量及循環壽命。

競爭產品：

與本技術競爭產品為傳統鋰離子正極材料製備技術。因傳統製備條件過程難以控制層狀結構正極材料的粒徑尺寸。傳統製備製備技術的煅燒溫度過高。

專利現況：

- (1)本技術將申請中華民國專利。
- (2)本技術團隊教授具有研究陶瓷材料二十年以上經驗。
- (3)本研究團隊具有十年以上研究螢光材料經驗。
- (4)本技術團隊教授為本校特聘教授，並獲得多次國科會傑出研究獎。

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New synthesis method for cathode materials used in lithium ion batteries

(Below is limited to 1-page only; be careful not to disclose vital technology content. Please delete these words when the document is finished)

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Market Needs:

The technology is related to synthesis a cathode material $\text{LiNi}_{1-x-y}\text{Co}_x\text{Mn}_y\text{O}_2$ of lithium-ion battery which is suitable for long-term stable use of electric vehicles. Compared to traditional battery technology, lithium-ion batteries can be charge faster, long-term use, and higher power density. Moreover, provided longer-lasting battery life in a lightweight package. This technology synthesizes the cathode material $\text{LiNi}_{1-x-y}\text{Co}_x\text{Mn}_y\text{O}_2$ of lithium-ion battery. Nature agar powders as a chelating agent to control the morphology and particle size of $\text{LiNi}_{1-x-y}\text{Co}_x\text{Mn}_y\text{O}_2$ powders, thereby effectively improving the battery capacity and increasing the stability of the battery for electric vehicles application.

Our Technology:

The present technology is related to a process to prepare layer-structured cathode material of lithium-ion batteries. This process can reduce the reaction temperature, control the morphology and particle size of powders. The capacity and cycle life of lithium ion batteries can be improved. This type of cathode materials is suitable application in renewable energy technology and electric vehicle industry.

Strength:

This technology uses natural agar powders as a chelating agent to prepare a highly crystalline lithium-ion battery cathode material. The cathode materials with unique morphology can be synthesis via this new technology. Furthermore, the reaction temperature can be reduced. Battery test result shows nice capacity and cycle life of the batteries.

Competing Products:

The previous conditional process is hard to control the grain sizes of layer-structured cathode materials. The calcination temperature of conditional process is too high.

Intellectual Properties:

- (1) This technology will be filed as a patent in our country.
- (2) The professor in the research team has studied ceramic materials for more than twenty years.
- (3) The research team has studied phosphors materials for more than ten years.
- (4) The professor in the research team is a distinguished professor at NTU, and has obtained many rewards from NSC.

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