

What happens if a lithium ion secondary battery is Pyro-processed in a rotary kiln?

The refractory lining in a furnace is always damaged and peels off when spent lithium-ion secondary batteries (LIB) are pyro-processed in a rotary kiln.

What happens when Li_2O & P_2O_5 react with a refractory?

When Li_2O and P_2O_5 (as well as LiF) react with the Al_2O_3 - SiO_2 refractory, an Li_2O - Al_2O_3 - SiO_2 - P_2O_5 (- LiF) phase with a low melting point forms and penetrates into the refractory through pores, grain boundaries, and cracks, resulting in peeling off.

Is MgO refractory a good choice?

From another point of view, it is expected to be preferable to use an MgO refractory with a gradient composition, which has been recently indicated to be resistant to the erosion of the Al_2O_3 - SiO_2 - CaO - CaF_2 melt by Han et al. [27].

5. Conclusion

What happens when pyro-processing a rotary kiln refractory lining is reduced?

During pyro-processing of an LIB in a rotary kiln to recycle the spent LIB, a phenomenon occurs in which the thickness of the refractory lining inside the kiln becomes reduced.

Cordierite Mullite Saggars are indispensable in the production of lithium battery cathode materials, offering a combination of thermal stability, chemical inertness, energy efficiency, and durability ...

This review summarizes the recent developments of niobium-based oxides as anode materials for lithium-ion batteries, discusses the special structure and electrochemical reaction mechanism ...

Controllable engineering of thin lithium (Li) metal is essential for increasing the energy density of solid-state batteries and clarifying the interfacial evolution mechanisms of a lithium metal negative electrode. ... 1 National Engineering Laboratory for High-Efficiency Recovery of Refractory Nonferrous Metals, School of Metallurgy and ...

Our results suggested the following mechanisms in Al_2O_3 - SiO_2 - CaO refractory damage during pyro-processing of spent LIB packs. First, Li_2O , P_2O_5 , LiF , and ...

This study explores a reactor for pyrometallurgical recycling, that offers the potential to overcome this bottleneck by simultaneously recovering lithium and phosphorous (P) via the gas stream, ...

The utility model discloses a high-temperature refractory plate for a lithium battery, which comprises a refractory plate box, wherein a heat dissipation hole is formed in the upper end of the refractory plate box, a sealing mechanism is arranged at the upper end of the interior of the refractory plate box and is communicated

with the heat dissipation hole, and a ...

Kiln furniture of cordierite, cordierite-mullite, fused quartz, mullite, aluminum titanate-mullite, silicon carbide, and corundum raw materials.

Faced with the forthcoming tide of retired lithium-ion batteries (LIBs), it is imperative to explore effective regeneration and upcycling strategies to alleviate the resource ...

The performance of a battery, including its energy density, cycle life, and thermal stability, is largely determined by the quality of these materials. Common CAMs include lithium cobalt oxide ...

The refractory lining in a furnace is always damaged and peels off when spent lithium-ion secondary batteries (LIB) are pyro-processed in a rotary kiln. ... Among these secondary batteries, the ratio of lithium-ion batteries (LIBs) has markedly increased. Compared with nickel-cadmium and nickel-hydrogen batteries, LIBs have the advantage of ...

Refractory Materials; Water Pumps. AC/DC solar submersible pumps; AC surface pumps; DC only submersible pumps; AC submersible pumps; Solar surface pumps; ... Type: Lithium ion Batteries; Battery Capacity: 10 kWh; Total Battery Energy: 5 kWh; Battery Rated Voltage: 48 V; Condition: Brand New; Tags: africell lithium batteries, Lithium batteries.

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