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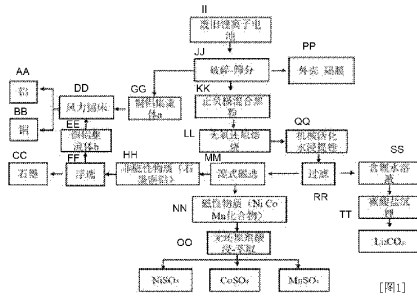
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(54) Title: MULTI-COMPONENT RECYCLING METHOD FOR SPENT LITHIUM-ION BATTERY

(54) 发明名称: 废旧锂离子电池多组分资源化方法



AA Aluminum
BB Copper
CC Graphite
DD Air table
EE Copper-aluminum current collector b
FF Flotation
GG Copper-aluminum current collector a
HH Non-magnetic substance (graphite-copper-aluminum)
II Spent lithium-ion battery
JJ Crushing-screening
KK Mixed black powder of positive and negative electrodes
LL Anaerobic reduction roasting
MM Wet magnetic separation
NN Magnetic substance (Ni, Co and Mn compounds)
OO Acid leaching-extraction without a reducing agent
PP Housing Separator
QQ Mechanical activation, and lithium extraction by means of water leaching
RR Filtration
SS Lithium-containing aqueous solution
TT Lithium precipitation by means of a carbonate

(57) Abstract: The present invention relates to a multi-component recycling method for a spent lithium-ion battery. The method comprises the following steps: step S1, performing mechanical crushing and screening to obtain a fine-fraction mixture of positive and negative electrodes, a medium-fraction copper-aluminum current collector a and a coarse-fraction mixture of a housing and a separator; step S2, carrying out an anaerobic roasting treatment to realize reduction and magnetization of a positive electrode material, carrying out lithium extraction by means of water leaching after the anaerobic roasting treatment, followed by filtration to obtain a lithium-containing aqueous solution and lithium extraction residues, and sorting and purifying a positive electrode material in the lithium extraction residues by means of magnetic separation; step S3, subjecting a non-magnetic mixture resulting from the magnetic separation to a froth flotation treatment, so as to obtain graphite and a copper-aluminum current collector b; and S4, on the basis of a difference in density, sorting and purifying the copper-aluminum current collector a and the copper-aluminum current collector b by using an air table, so as to separately obtain a copper foil and an aluminum foil. In the present invention, the efficient recovery of multiple components of a spent lithium-ion battery is effectively achieved, the process flow is simple, and the method is easy to operate, and is safe and reliable.

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根据细则4.17的声明:
— 关于申请人有权申请并被授予专利(细则4.17(ii))
本国际公布:
— 包括国际检索报告(条约第21条(3))。

(57) 摘要: 本发明涉及一种废旧锂离子电池多组分资源化方法。其包括如下步骤: 步骤S1、在机械破碎筛分后获得细粒级正负电极混合物、中粒级铜铝集流体a以及粗粒级外壳隔膜混合物; 步骤S2、进行无氧焙烧处理, 实现正极材料还原与赋磁, 并在无氧焙烧处理后进行水浸提锂, 过滤得到含锂水溶液以及提锂残渣, 采用磁选实现提锂渣中正极材料的分选提纯; 步骤S3、对上述磁选后得到的非磁性混合物进行泡沫浮选处理, 以得到石墨以及铜铝集流体b; 步骤S4、对上述铜铝集流体a与铜铝集流体b, 基于密度差异, 采用风力摇床进行分选提纯, 以分别得到铜箔与铝箔。本发明有效实现废旧锂离子电池多组分的高效回收, 工艺流程简单, 易于操作, 安全可靠。