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Title

DESULFATIZATION, OPTIMIZATION AND APPLICATION TECHNIQUE OF THE SPENT PLATES PROVIDED FROM CAR BATTERY

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Patent/ Application number

Patent OSIM no.: RO134764- B1/30.12.2022

Short presentation

The invention relates to a recycling and desulphatization technique of the plates from spent car batteries by the melt quecching method and the incorporation of NiO or Co_3O_4 contents in order to improve the electrochemical performance of new materials for applications as electrodes on batteries. X-ray diffractograms of recycled and doped materials with 8 mole% NiO or 20 mole% Co_3O_4 show the disappearance of the sulphated phases of lead ions, respectively $4PbO{\cdot}PbSO_4$ and Pb_2SO_5 crystalline phases below the detection limit. The electrochemical performance of recycled and desulfatizated materials with metallic ions was demonstrated from cyclic voltammetry measurements. For the electrode material doped with 20 mol% Co_3O_4 the reversibility of the voltammogram after scanning of three cycles was increased comparatively with its analogue with 8 mol% NiO.

Applicability

This invention proposes two types of recycled and metal-doped materials for the applications as new electrodes at batteries. The invention relates to the recycling and regenerating processes of new electrode materials for batteries by the conversion of lead sulphates from spent plates into metal oxides. The electrode made of recycled material and optimized with metal oxide has electrochemical performance clearly superior comparative with the undoped electrode, the evolution processes of hydrogen are undetectable and the anodic passivation phenomena are much diminished.

Images

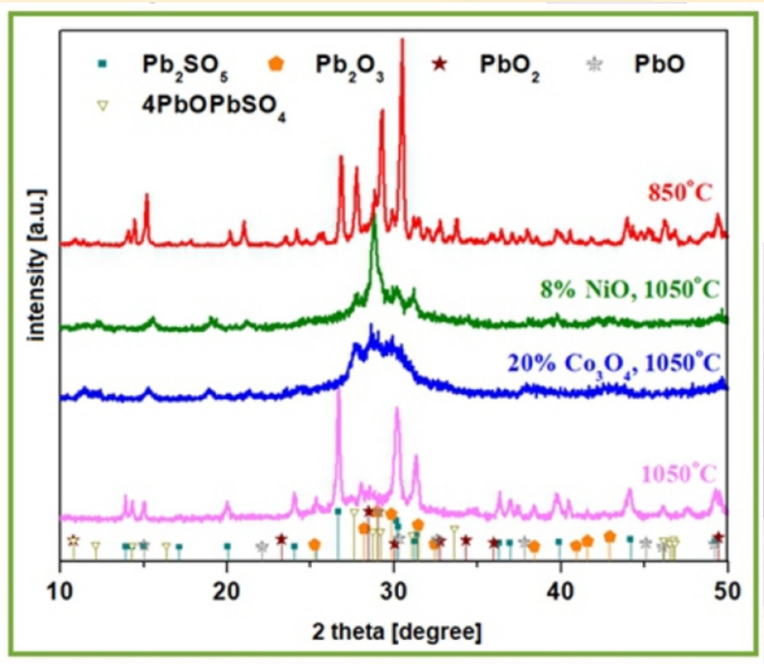

Figure 1: X – ray patterns of the recycled materials prepared at varied temperature and with different dopant contents.

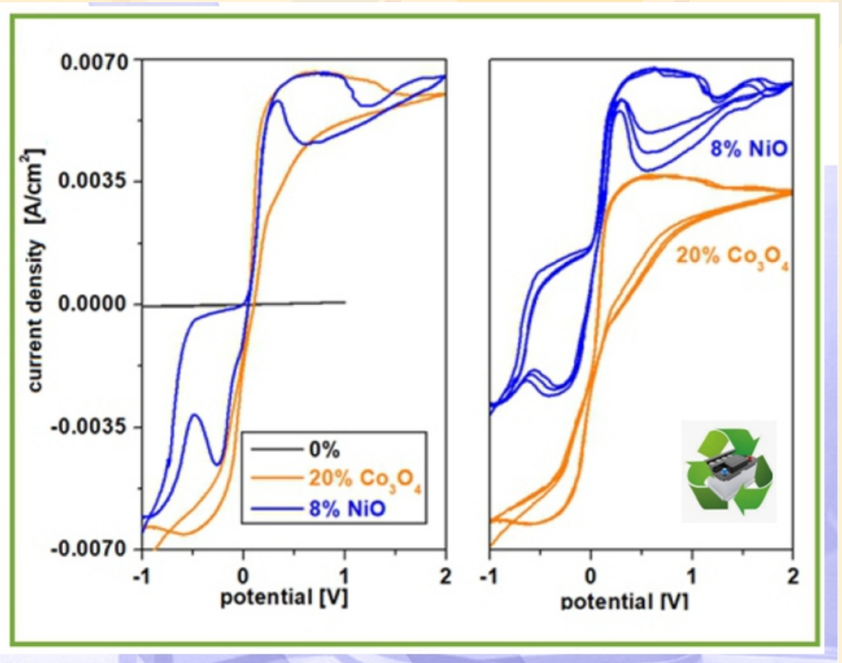

Figure 2: Cyclic voltammograms scanned for a) the first cycle and b) three cycles of the recycled and metal-doped electrode materials in electrolyte solution of 5M H_2SO_4.