Short Communication

A New Approach in Recycling Waste Foundry Sand for the Preparation of Porous Silicon Powder

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Disposal of waste foundry sand is still one of the most critical challenges faced by the foundry industry. The recycling and reusing of waste foundry sand not only lead to a saving of naturally abundant sand sources but also enhance the sustainability of environmental protection. A new approach in recycling waste foundry sand is introduced in the paper. Based on this approach, porous silicon powder is scalably fabricated, employing magnesiothermic reduction. In the initial one cycle, the capacities of the charge and discharge are 2210 mAh/g and 1602 mAh/g, respectively. The coulombic efficiency of the as-prepared porous silicon is about 72%. The as-prepared porous silicon is considered as the potential material for the preparation of silicon-based anodes in high energy Li-ion batteries.

Keywords: waste foundry sand; porous silicon; magnesiothermic reduction; Li-ion battery

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