Iron slag energy storage material

Iron and steel mills are energy- and material-intensive industries because they have brought down the time for transformation from iron ore to steel within a day. ... Worldwide iron slag production in 2014 was estimated on the order of 310-370 Mt, while steel slag was about 170-250 Mt [7]. In ...

As can be seen from Figure 3, slag can be divided into five types, including blast furnace slag (BFS), molten iron pretreatment slag, converter slag (BOFS), electric arc furnace slag (EAFS) and casting residue slag (LFS). In China, converter slag accounts for the largest proportion, reaching 80% of the total steel slag.

Steel slag is produced in the melting process of the iron ore and about 10-20% of slag is generated per ton of steel [3]. Steel slag is mostly consist of oxides of aluminum, calcium, iron, magnesium and silicon [7], [19], [20]. ... This study tested a new sustainable and low-cost sensible thermal energy storage material (STESM) based on ...

Slag is one of the main waste materials of the iron and steel manufacturing. Every year about 20 × 106 tons of slag are generated in the U.S. and 43.5 × 106 tons in Europe. The valorization of this by-product as heat storage material in thermal energy storage (TES) systems has numerous advantages which include the possibility to extend the working temperature ...

The energy storage density for 30 cycles was reduced by 10.26 % for the pellets compared to the powder material, but the average light absorption rate was improved. ... [30], generating over 150 million tons of steel slag. Using steel slag as a CaO-based material can alleviate the problems of land waste and environmental pollution caused by the ...

Steel and iron-making slag contain 30-60 wt% of calcium oxide (CaO) and 3-15 wt% of magnesium oxide (MgO), suggesting high CO 2 storage capacities [19]. It has been reported that the potential CO 2 sequestration capacity if using alkaline industrial waste is 310 Mt CO 2, and steel and iron-making slag sources can contribute to a 43.5% ...

Therefore, high calcium and high iron steel slag ceramics is an ideal thermal storage material with lower cost and superior thermal shock resistance. (2) Cordierite accelerates sintering by generating large amounts of liquid phase, increasing the density of the sample, changing the phase composition and microstructure, and ultimately improving ...

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