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METHOD OF PREPARING ORE BRIQUETTES

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1 Claim. (Cl. 75—3)

Since the extraordinarily fine raw substances of the metallurgical industry, such as flotation ores, dust from metallurgical operations, ore concentrates, and the like, tend to give rise to troublesome dust formation during the working up of the same, one has turned to preparing these materials for smelting by agglomerating or briquetting them. However these processes were not very satisfactory, since in the working up of the sinter material obtained by agglomerating considerable dust loss was unavoidable, and the shaped pieces obtained by briquetting were not sufficiently heat-stable and reactive.

These drawbacks are removed if, according to the present invention, the ore material is briquetted with employment of not more than 2% of sugar or sugar-containing material as binding agent, and the pressed pieces thereupon hardened by a heat treatment at moderately raised temperatures at which the sugar material caramelises, e. g. at about 200–300° C., depending upon the size of the briquettes prepared and upon the duration of heating employed. It has been found to be advantageous to subject the material to be briquetted to a preceding drying if necessary.

As binding agents within the sense of the present invention preferably beet sugar, cane sugar, dextrose and so forth may be used.

In this way briquettes are obtained which are satisfactorily resistant to heat or fire and incandescence and at the same time possess a certain porosity which has a favourable effect during the working up in the furnace with addition of the auxiliary material necessary for the chemical reaction. These auxiliary materials may also be added to the material before the briquetting operation, and in many cases this will be advisable.

Example

100 kg. of a flotation copper pyrites, for example with a content of S=48.46, SiO_2=0.59, Cu=23.2, Zn=0.15 and Fe=22.28, are dried off up to a water content of 3–5% and thereupon intimately mixed in a suitable mixer with 2 kg. of sugar and 4 litres of water. The mixture is then worked up on a briquetting press to shaped pieces of any desired size and form. The pressed pieces obtained are, for the purpose of consolidating, finally hardened at about 200–300° C. when chemical reaction occurs with conversion of the sugar material into a water insoluble product. The time of heating necessary for effecting the hardening is longer the lower the heating temperature; it also depends upon the size of the briquettes.

Instead of working up the pure ore mixture in the said way, the same can be briquetted with equally good result mixed with the slag formers usual in smelting operations, such as limestones, quartz, etc.

In every case briquettes are obtained of high resistance to fracture and stability towards incandescence and of sufficient porosity and gas permeability. They are stable on storage and resistant to water but nevertheless possess sufficient porosity to have the desired reactivity in the blast furnace.

The term "about" in this specification and the claim appended thereto is meant to include differences from the values stated amounting to ±15%.

What I claim is:

A method of preparing ore briquettes in a form suitable for smelting operations, consisting in mixing the ore material with not more than about 2% of sugar material, briquetting the mixture, and hardening the briquettes by heating them at about 200–300° C.

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