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Study on increase produce influence factors of antimony white in Jiyuan Wanyang Smelting Co. LTD

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Abstract. The technology of recovering antimony white from the slag in the lead anode slime is used Jiyuan Wanyang Smelting (group) co., LTD. Due to the increase in the processing amount of lead anode slime, the amount of slag increases continuously, and the upstream crude antimony production capacity is large, resulting in a large amount of crude antimony alloy inventory, which shows the problem of insufficient antimony white production capacity. Through the analysis of the key factors affecting the output of antimony white in the production process, the production of antimony white was improved by improving the grade of oxidized antimony alloy, prolonging the production cycle, shortening the time of the production, adjusting the level of the liquid, increasing the air volume of the fan and increasing the utilization space of the dust collector. The practice shows that the daily yield of antimony white can be increased by 75%.

1. Introduction

Antimony white is white antimony trioxide (Sb_2O_3) with fine particle size. It is important chemical raw materials, widely used in enamel, pigment, paint, plastic, glass, ceramics, fireproof fabrics and other manufacturing operations^[1-10]. In this paper, the factors affecting the production of antimony white are summarized according to the oxidation furnace antimony white process and the actual production process of antimony white in Jiyuan Wanyang Smelting company.

2. Process principle and process

After enriching the slag and soot produced by lead anode slime, the raw antimony alloy produced by reduction smelting was mixed with auxiliary materials, and then it was added to the reduction smelting process. Thus, the separation of antimony, lead and bismuth can be achieved. Anode sludge contains Sb 40 ~ 45%, Pb 10 ~ 18%, soot contains Sb 50 ~ 60%, Pb 1 ~ 2%.

3. Measures to increase output

3.1. Increase the grade of crude antimony alloy

Before the experiment, the crude antimony alloy produced by using only anode sludge has low grade and high lead content, which leads to high antimony white lead. When soot and anode sludge =1:3 mixed smelting, it can improve the grade of crude antimony alloy, reduce the impurity lead in the alloy, and effectively improve the grade in the alloy.



3.2. Extend the production time of oxidation pot

Before the experiment, the grade of the oxidized pot was controlled at 27~28%, and the grade of the supplementary alloy was controlled at about 50%. The production cycle of the oxidized pot was 48 ~ 55 hours, which led to the frequent output of the oxidized pot. When the crude antimony alloy is raised, the oxidation pot grade control can be controlled in 33 ~ 35%, adding alloy grade control in about 65%, the oxidation pot production cycle is controlled in about 120 hours.

3.3. Shorten the time of adding and removing the pot

The process of going out of the pot is changed from manual going out of the pot to mechanized going out of the pot. When going out of the pot, the metal pump is used to directly extract the alloy liquid. The time of going out of the pot is greatly compressed. The following table is the comparison table of time consumption of each link before and after mechanical pump improvement.

Table 1 Comparison table of time consumption of each link before and now mechanical pump improvement

| Cooling time | | Out of the pot time | | Heating up time | |
|--------------|-------|---------------------|----------|-----------------|--------|
| Before | Now | Before | Now | Before | Now |
| 1 h | 15min | 2~3 h | 40~50min | 1~1.5 h | 30 min |

3.4. Adjust antimony liquid level

The depth of antimony liquid in oxidizing pot is basically invariant, and the depth of antimony liquid is mainly affected by the amount of primary air. When the position of oxygen blowing pipe is fixed, and the depth of antimony solution increases by 1mm, the air resistance of the primary air duct will increase by about 66Pa, which will cause a great change in air volume, leading to the unstable oxidation process, thus affecting the product quality. In order to maintain the oxidation speed of the oxidation pot, our company according to the concentration of Sb in the oxidation pot continuously enhance the level of the oxidation pot to make up for the decline of Sb concentration in the oxidation pot. According to the same pot times, with the production of the case, the production cycle shortened 5~6 hours.

3.5. Increase the temperature of the oxidation pot

As the oxidation chemical reaction goes on, Sb concentration in the oxidation pot is falling, according to the chemical balance movement, concentration, pressure, temperature change will change the new balance movement, in Sb concentration decline, pressure remains unchanged, increase the temperature in the oxidation pot to maintain the new chemical balance. Although increasing temperature accelerates the oxidation rate of antimony, it has practical effect on antimony production. However, the oxidation rate of the metal impurities Pb, Bi, As, Se and Cu in the raw materials is also accelerated, and the lead content of the impurity antimony triwhite will be significantly increased. Can only be used in a certain period of time, not continuous temperature, otherwise it will affect the quality of antimony white.

3.6. Improve the utilization rate of fan air volume

In order to avoid the impurities in the air into the pot white pollution product quality in the suction fan, filter is used in the fan import. The original round hole of the filter element was changed into a strip shape, the blast volume of blowing charging obviously increased.

3.7. Improve the utilization of dust collector space

Our company requires to ash the packaging machine within 12 hours of production to make room for the dust collector. The output of antimony white single pot is increased significantly, and the output of each batch can be increased by about 100kg. Through the comparison of the above measures, it was

found that the yield of antimony white increased significantly, from about 1000kg per day to about 1625kg per day.

4. Conclusion

In this paper, according to the actual production process of antimony white, the factors affecting the production of antimony white are summarized, including the following aspects. Improve antimony white grade, prolong the oxidation pot production time, shorten the time of adding the pot out of the pot, adjust the liquid level height, improve the oxidation pot temperature, improve the utilization rate of fan air volume and improve the utilization rate of dust collector space. With these measures, the daily output of antimony white can be increased from 1000kg/d to 1625kg/d, and the production cost and labor intensity can be greatly reduced.

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