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DETINNING OF TIN SCRAPS IN INHIBITOR IMPREGNATED ACID MEDIUM

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, Old Mill Road, New Delhi-1, India, an Indian registered body incorporated under the Registration of Societies Act (Act XXI of 1860).

The following specification particularly describes and ascertains the nature of this invention and the manner in which it is to be performed.

This is an invention by NARASIMHAN VENKATAKRISHNAN, Dr. ROSHAN LAL SETH and Dr. PREM BEHARI MATHUR, all the three of the Central Electrochemical Research Institute, Karaikudi-3, S. Rly., India, are Indian citizens.

The huge quantities of the scraps which accumulate every year in Tin plate industry are a valuable secondary source of tin metal whose requirements are met solely by the import. 100879 tons of the tin plates were produced in the country during the year 1963. The estimated demand of the plates by the end of IV Five Year Plan that is in the year 1970—1971 is nearly five lakh tons. The tin scrap which may accumulate during 1970—1971 will therefore be 50 to 75 thousand tons (10 to 15 per cent. of the tin plates) and the tin metal recoverable from this scrap will be nearly 500 to 750 tons, the market price of which will be nearly 1.5 to 2.25 crore rupee.

Tin can be removed from the tin scraps by the action of a strong acid provided the attack of the acid on the basis metal iron is completely inhibited at the operational temperature. The present patent describes a solution which contains a strong mineral acid along with a small amount—0 to 2 per cent. of formaldehyde which acts as very efficient inhibitor for the reaction between acid and the iron. The electrolyte thus attacks only tin coating on the tin scraps or sheets and not the iron base. Less than 0.2 per cent. of the total weight of the iron passes into the solution. The detinning of scraps can be carried out at quite a fast rate at a temperature of 60° C. and below. The quantity of the tin scraps which can be detinned in a definite volume of the electrolyte and the time taken for the complete removal of the tin from the scraps depends upon the thickness of the tin coating on the scraps.

Example : 15 litres of commercial hydrochloric acid and 150 ml. of BDH—LR (37/41 per cent. by weight/volume) formaldehyde was taken in an ordinary glass container. The vessel containing the solution was heated to 60° C. by means of an immersion heater. 5 kg. of tin scraps were immersed in the vessel and removed after about 30 minutes. The detinned scraps were washed with tap water. In a similar way another 35 kg. of tin scraps were immersed in the same solution contained in the vessel in 7 batches, 5 kg. in each batch, and each time the scraps were kept in the vessel for half an hour. Thus 40 kg. of scraps were detinned in 8 batches within 4 to 5 hours in 15.15 litres of solution maintained at about 60° C.

We claim :

1. A process of detinning of tin scraps for the recovery of tin metal and the utilisation of waste iron scraps, wherein the tin scraps are treated with a concentrated solution of mineral acid containing an inhibitor.

2. The process as claimed in Claim 1 wherein a dilute solution of formaldehyde is used as inhibitor for the reaction between acid and the iron base.

3. The process as claimed in Claim 1 or 2 wherein the detinning is carried out at a temperature much below the boiling point of the solution.

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Price : TWO RUPEES.

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