

RECOVERY OF NON-FERROUS METALLIC
VALUES FROM METALLURGICAL WASTES (*)

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INTRODUCTION

With the increased industrial expansion and ever increasing consumption of non-ferrous metals in India, utilization of low grade and complex ores, recovery of metals from waste products like slag, ashes and dross, apart from conservation of the non-ferrous metals not available in the country, by their judicious uses and by substitution, wherever possible, is a matter of great importance.

The paper outlines briefly the work done so far in the N.M.L. and the work in progress on the reclamation of metallic values from the wastes like dross ashes and residues.

Recovery of Aluminium from Aluminum Dross:

1) Samples of aluminium waste products containing 8% - 14% metallic aluminium in the form of fine inclusions in the flux were economically recovered. Recovery was around 60% of metallics.

2) Another sample containing 49.9% metallics was also suitably treated to give a recovery of 75% metallics.

Recovery of metallic values from brass dross:

A sample of brass dross in the form of fines and associated with coke, silica and oxides of Cu and Zn was economically treated and recovery of 95.4% total zinc and 94.1% of total copper was achieved.

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Recovery of Zinc from Zinc dross:

Systematic studies were carried out on the distillation of Zinc dross both at atmospheric pressure and at reduced pressures and recovery of zinc from dross was 92% and 98% by the respective methods.

Treatment of zinc wastes obtained in the form of fine oxidised powder:

Zinc wastes in the form of fine powders containing 71% metallic zinc was economically treated by the patented process developed at the N.M.L. A recovery of 88% metallic zinc was obtained. "Zinc blowings" from tube galvanizing plants could also be economically treated by the above process.

Treatment of zinc ash:

A sample of zinc ash received from a galvanizing plant analysed 52.8% metallic zinc and 84.9% total zinc. The low zinc content in the particular sample is attributed to aging.

Hand picking and Jigging of the crushed -3 mesh size product gave a recovery of 97.5% metallic zinc, which can be easily subjected to melting.

Treatment of the waste Mg. metallic powder:

Oxidised magnesium powders containing 68-93% metallic magnesium were treated by the patented process developed at the N.M.L. and the product was upgraded to contain 98-99.5% metallic magnesium. The powder after treatment was found quite suitable for application in pyrotechnics.

Treatment of Die casting scrap alloys:

Die casting zinc base alloys of zamak group containing impurities like Fe, Pb, Ca and Sn were successfully treated for recovery of zinc in pure form by distillation of the scrap alloy under reduced pressures.

Conclusion:

It may be stated in conclusion that metallic and other values could be economically recovered from waste products provided suitable techniques are developed and adopted for each type of sample. Samples though similar in nature may require a different treatment method in view of the slight variation in the nature of the waste product.