SIMS RECYCLING SOLUTIONS

Processing and Preparation of Waste Electrical and Electronic Equipment (WEEE) for Precious Metals and commodities assay.

Pawel Jasinski – SRS Franklin Park, IL

Introduction

Sims Recycling Solutions has developed its capabilities over the years to become one of the world's largest recyclers of electronic scrap.

In its fiscal year 2018, SRS processed 430,000 metric tons of electronic waste. Such enormous process flows require optimized process solutions and knowledge of metals content and value of various types of material. It can get very challenging with WEEE scrap due to the low concentrations of precious metals.

SIMS RECYCLING SOLUTIONS

Introduction

Sims Recycling Solutions lab in Franklin Park, IL has almost 50 years of experience in assaying precious metals and determining the content of all types of electronics.

SIMS RECYCLING SOLUTIONS

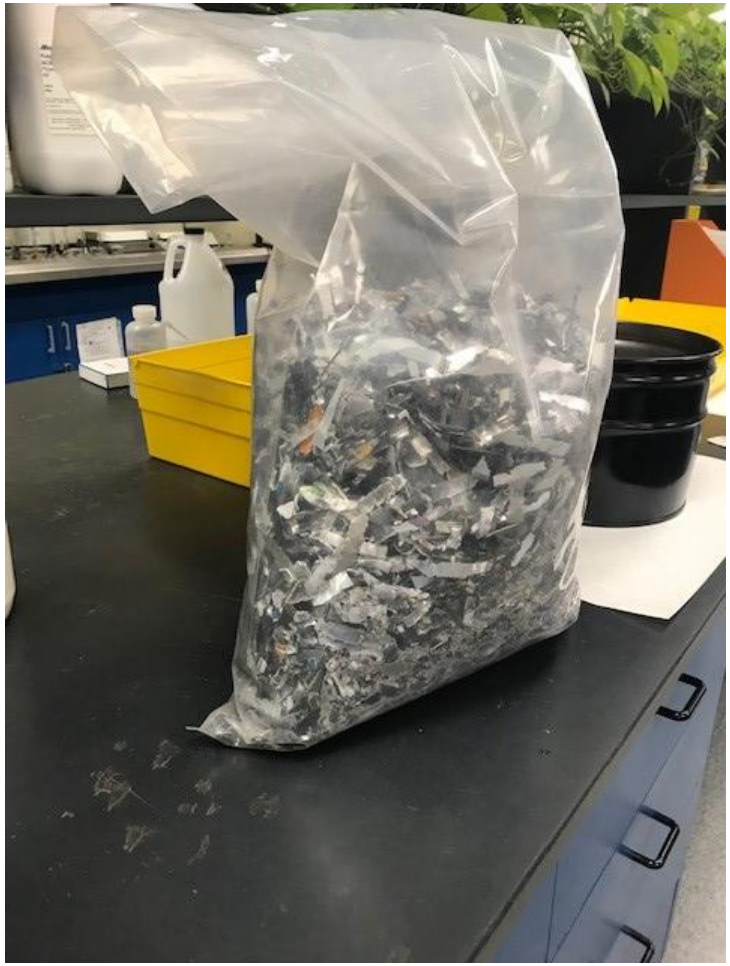
WEEE – Printed Circuit Boards

Preparation of PCB for analysis:

- Preparation of representative sample
- Dismantling
- Separation
- Incineration
- Milling and fraction segregation
- Processing of a sample (Weighing, Fire Assay, Wet Chemistry, Flame AAS)
- Data record

SIMS RECYCLING SOLUTIONS

Preparation of representative sample

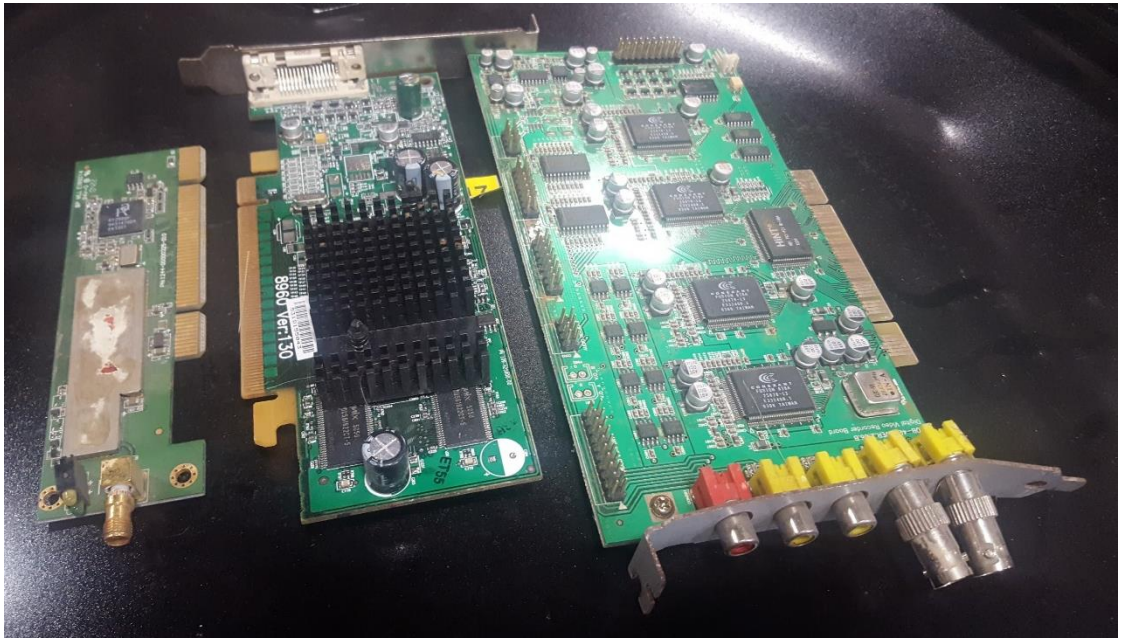


SIMS RECYCLING SOLUTIONS

Dismantling

Removal of PCB components:

- Connectors (outputs/jacks)
- Metallic/plastic covers/frames
- Capacitors
- Batteries
- Au plated fingers
- Au plated pins
- Wires
- etc.



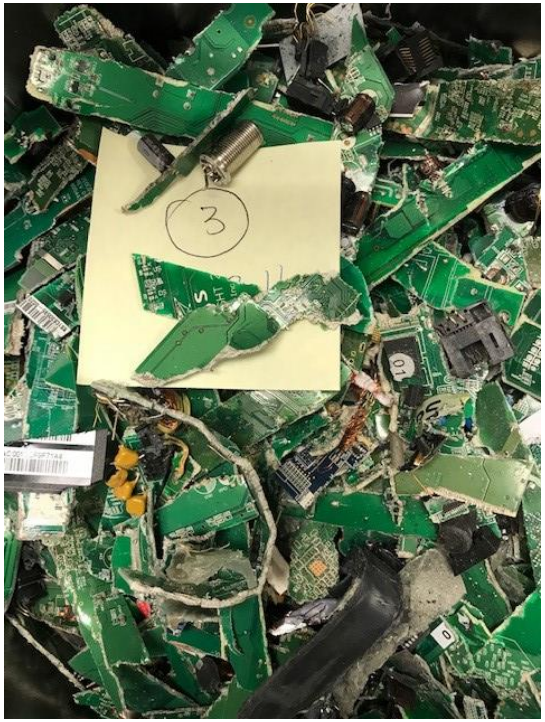
SIMS RECYCLING SOLUTIONS

Separation

SIMS RECYCLING SOLUTIONS

Separation

Separation of plastic, metallic and PCB parts.

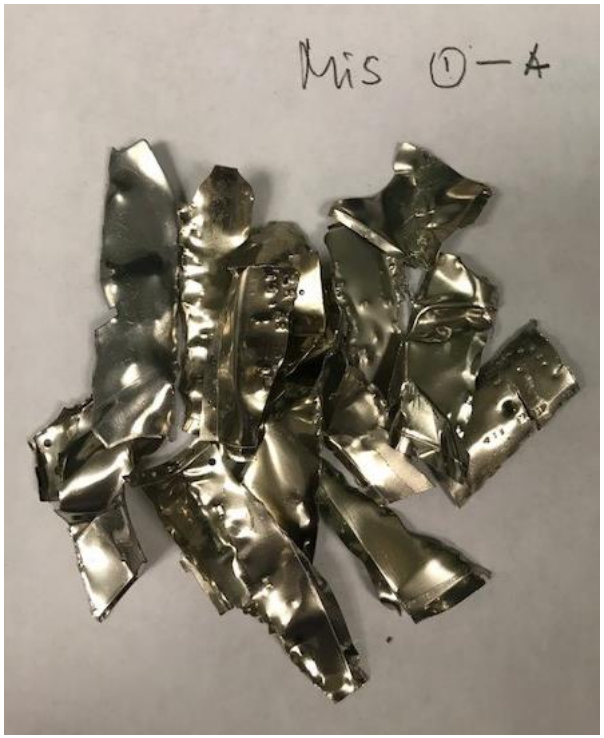


SIMS RECYCLING SOLUTIONS

Separation

Separation of metallic parts:

A – majority Cu



B – majority Zn

SIMS RECYCLING SOLUTIONS

Separation

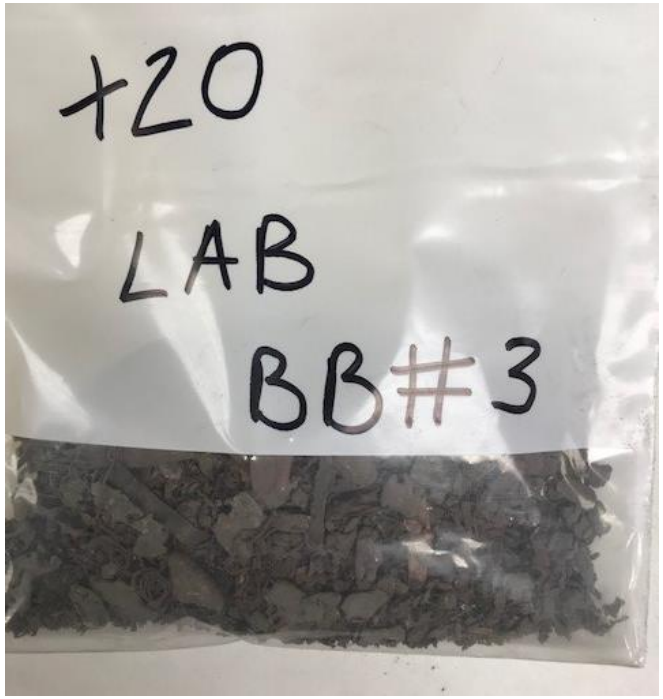
C – magnetic

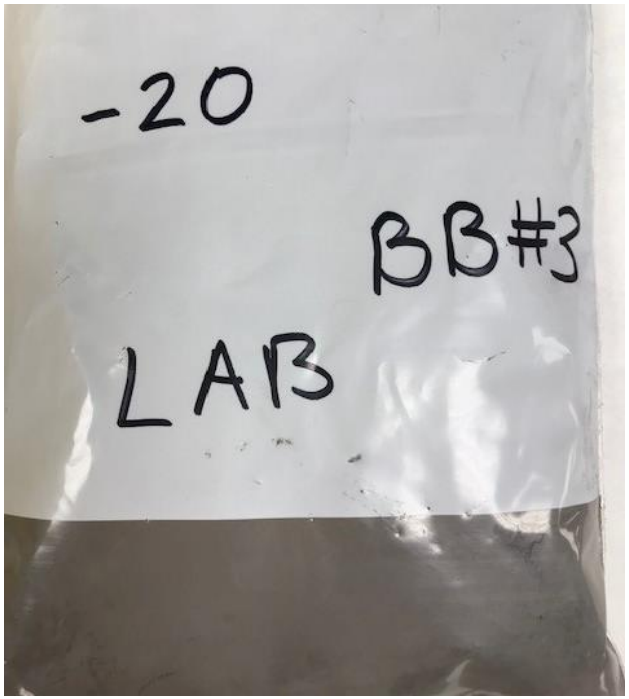
D – majority Al

SIMS RECYCLING SOLUTIONS

Incineration and milling

After separation of the material, the shredded PCB were roasted at 900+°F (480+°C) in the incinerator. Followed by milling in a puck mill and segregating to +20 and -20 fractions.





SIMS RECYCLING SOLUTIONS

Sample processing

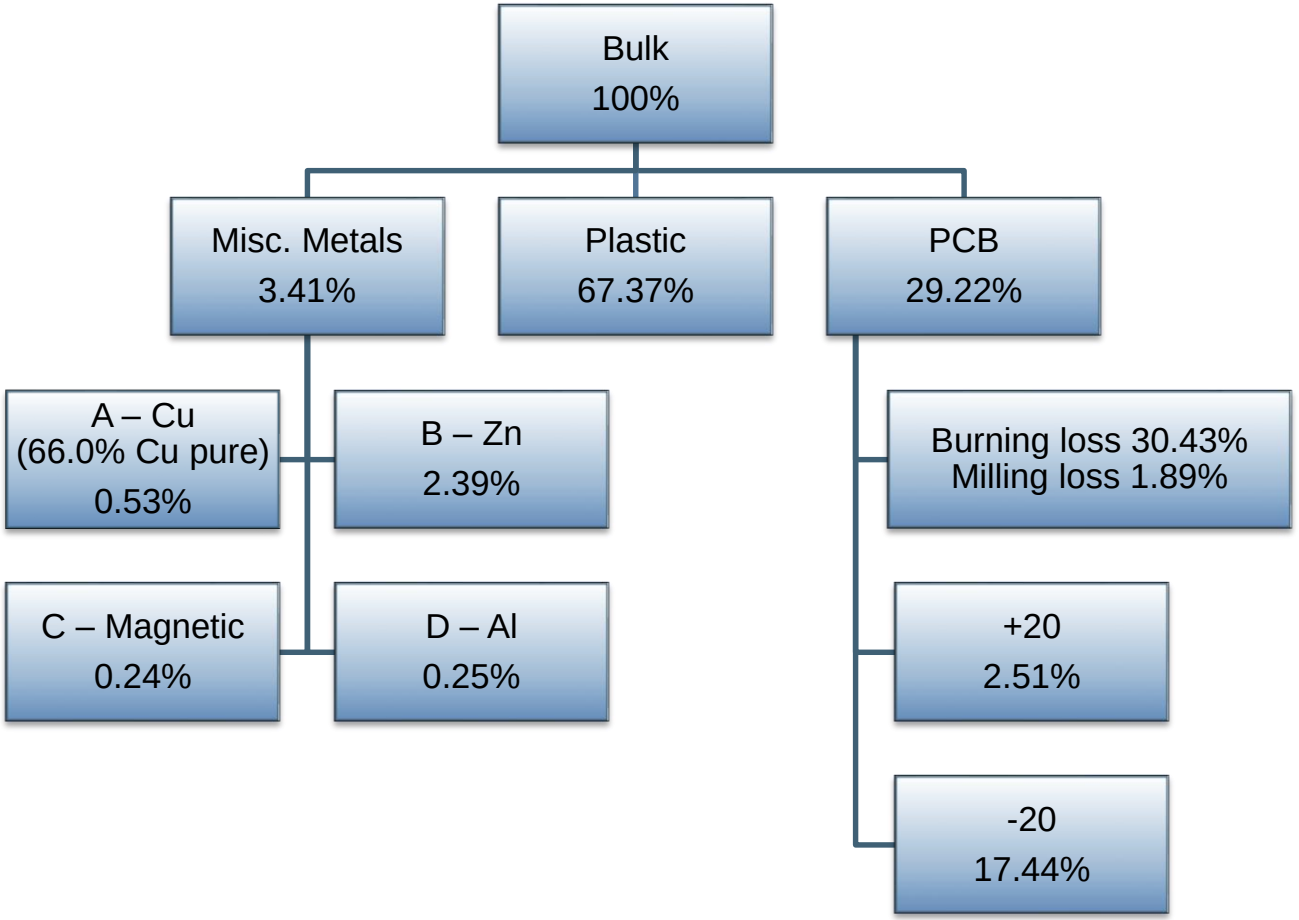
- Sample preparation – samples were weighed from +20 and -20 fractions for precious metals assay and Cu titration. Additional sample for Cu titration was taken from “miscellaneous metals – A”.

- Fire Assay – samples designated for PM assay were scorified and cupelled in assay furnace. Afterwards, the weights of Doré beads were recorded.

- Flame AAS – Doré beads were dissolved in acids and their solutions were analyzed by flame atomic absorption spectroscope.

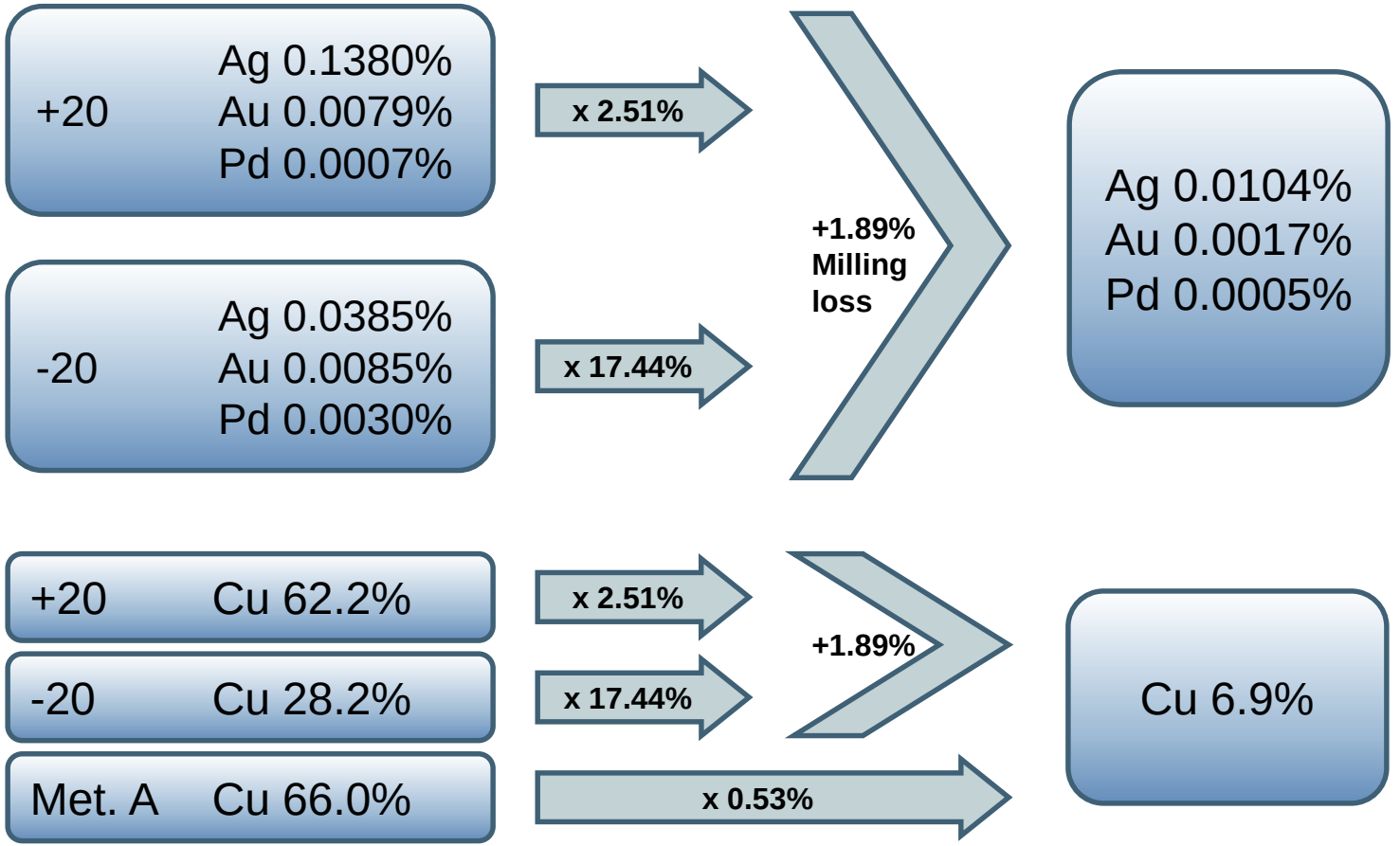
SIMS RECYCLING SOLUTIONS

Data record



SIMS RECYCLING SOLUTIONS

Data record



SIMS RECYCLING SOLUTIONS

THANK YOU FOR YOUR ATTENTION!

SIMS RECYCLING SOLUTIONS