

006194

Report on the Microprobe Analysis
of Anvil Zinc Concentrate Samples

(January 1974 through October 1974)

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Microprobe Analysis of Anvil Composite
Zinc Concentrate Samples

January 1974 through October 1974

Enclosed please find the Computer print-out results of the microprobe analysis of the above mentioned zinc concentrate samples.

The technique of mounting the samples, polishing, evaporation of a conductive coating of carbon on the specimens, and analysis in the microprobe is essentially the same as that used here on all previous Anvil zinc concentrates.

In this series of analyses, a pure single crystal of ZnS (Eastman Kodak "Irtran") was used as a standard for both the zinc and the sulphur content of the sphalerite grains. Pure Manganese and Iron were used as standards to determine the Mn and Fe content respectively. In previous work, pure Zn, Fe, and Mn were used as standards and the sulphur was determined by difference.

Results

Please refer to the computer print-outs and Table 1.

The results for the January 1974 sample appear on two separate print-outs, whereas all the other samples were run in complete batches.

At least ten clean sphalerite grains were analysed in each monthly sample. The individual results for both weight percent and atomic percent are to be found on the print-outs as well as the averages and two sigma deviations for the sample. In case of the January 1974 Sample, since there are two computer runs involved, there are two sets of averages. I have calculated the averages for the entire January 1974 Sample and they appear in Table 1.

Please note that the computer is programmed to calculate weight percentages directly by comparison with the standards unless it is requested to determine one element by difference. In this series of results, since all four major constituents were determined, then the total weight percent of the four elements should add to 100 percent. In Table 1 these totals are tabulated and it is apparent that the individual analytical results must be quite accurate.

The results tabulated for atomic percentages always add to 100 percent since the computer is programmed to make this so.

The weight percent averages for Zn, Fe, and Mn have been plotted against the date of the samples in Fig. 1.

There is a very good positive coorelation between the Mn and Fe content and an equally good negative coorelation between the Zn and Fe plus Mn contents. The May 1974 and September 1974 samples both indicated a low zinc content and a high Fe plus Mn content in the sphalerite.

It would be interesting if the Zn concentrate produced during the months of May and September 1974 could be traced to a particular zone of the Pit.

Conclusions

1. The overall average composition by weight of the sphalerite present in the concentrate samples January 1974 through October 1974 was: Zn, 56.06%, Fe, 8.97%; Mn, 0.71%; S, 33.58%
2. The sphalerite in the concentrate samples dated May and September 1974 was significantly lower in zinc content and higher in iron and manganese content than the average.
3. The use of a pure ZnS standard in the microprobe analysis of sphalerite yields much more acceptable results than the use of a pure Zinc standard for the zinc analysis and determining the sulphur by difference.

Table 1

Sample	Zn wt%	Fe wt%	Mn wt%	S wt%	Total
Jan 74	56.21	8.18	0.80	33.59	98.78
Feb.	56.50	7.39	0.39	33.61	97.89
Mar.	55.28	8.90	0.85	33.93	98.96
Apr.	55.26	8.79	0.73	33.40	98.18
May	53.62	10.01	1.53	33.84	99.00
Jun.	57.08	8.93	0.53	33.20	99.74
July	58.51	8.87	0.41	33.24	101.03
Aug.	57.11	8.93	0.14	33.43	99.61
Sept.	54.60	9.98	1.00	33.57	99.15
Oct.	56.45	9.68	0.70	34.02	100.85

Average

Jan. 56.06±0.89 8.97±0.51 0.71±0.25 33.58±0.18 99.32

through
Oct.

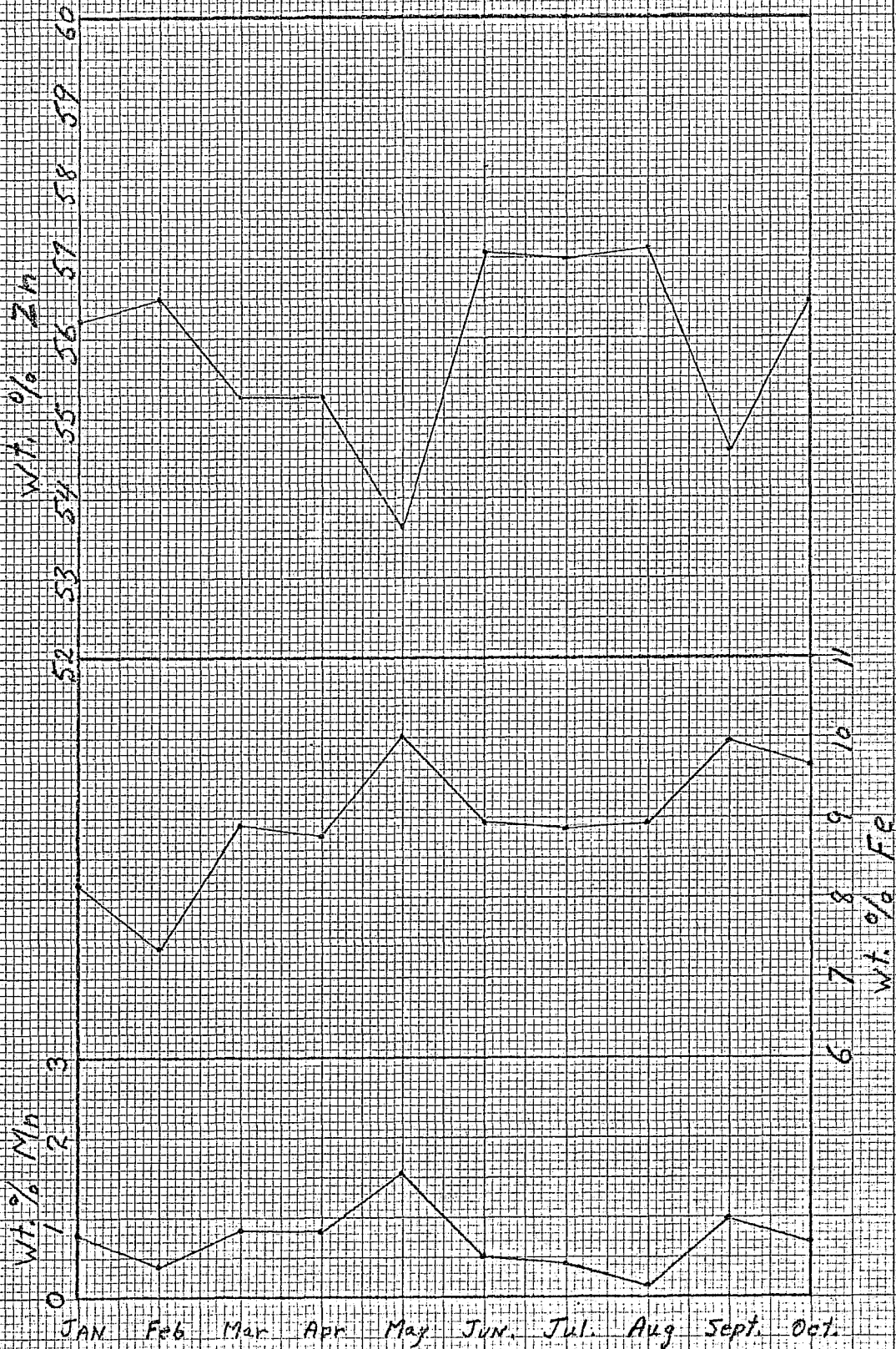


Fig. 1