outokumpu MINING /Mining Services
Geoanalytical Laboratory

REPORT
075/Bidjovagge, Samples 12-14.1.90/EH/90

February 12, 1990

BIDJOVAGGE/MINERALOGICAL STUDY ON PROCESS SAMPLES 12. AND 14.1.1990

Esko Hänninen

Geoanalytical Laboratory

Veikko Palosaari
Manager

DISTR. Bidjovagge/M Ekberg (2 copies)
GAL/E Hänninen, archives

BV 2650

BIDJOVAGGE/MINERALOGICAL STUDY ON PROCESS SAMPLES 12. AND 14.1.1990

CONTENTS PAGE

Appendices

1. INTRODUCTION

Two ore and two concentrate samples were received from Bidjovagge Gruber for mineralogical study. The copper concentrates produced from the C1 ore in 12th and 14th, January were rather low in copper. The copper content of the products was only 15 - 17 %. The samples were studied by analytical and microscopical methods. To calculate the mineral compositions of the samples some chemical analyses were carried out by the AAS method after HNO3 and bromine methanol dissolution. The sulphur content were analysed by a Leco determinator.

2. CHEMISTRY OF THE SAMPLES

Chemical compositions of the samples and recoveries of metals are given in Table 1 in Appendix 1. The ore is quite rich in copper (2.8 - 3.6 % Cu). The copper content of the concentrates is relatively low, 14.6 - 17.0 %. Recovery of copper varies between 87.5 and 91.9 per cent.

3. MINERALOGY

The estimated mineral contents of the samples are given in Table 2 in Appendix 1. The ore processed has been rich in pyrite (Fig. 1 and 2, Appendix 2). The pyrite content of the feed has been nearly 30 wt-% in 12.1.90. Also the concentrates are rich in pyrite (Fig. 3 and 4, Appendix 2) although the recovery of pyrite to the concentrate is only about 20 %. The pyrrhotite content of the ore is quite low, 6-7 wt-% and it seems that pyrrhotite is almost totally depressed to the tailings.

The main sulphides (pyrite, chalcopyrite and pyrrhotite) occur mostly as liberated particles in the milled feed and in the concentrate. There are also remarkably other than sulphidic impurities in the concentrates. According to the microscopic observations it seems that silicates, probably quartz, some other silicates and carbonates have been floated in some extent to the concentrate. The amount of the "other" impurities in the concentrate is between 16 and 25 wt-% (Table 2, Appendix 1).

Table 1. Metal contents and recoveries

DATE	PRODUCT	Weight	Cu		Au		Fe(Brm)		S	
		%	%	Recov.	g/t	Recov.	%	Recov.	%	Recov.
12.1.90	Ore	100.0	2.77	100.0	1.76	100.0	7.30	100.0	20.8	100.0
	Concentrate	17.4	14.60	91.9	7.84	77.7	15.30	36.6	36.6	30.7
	Tailing	82.6	0.27	8.1	0.47	22.0	5.61	63.4	17.4	69.3
14.1.90	Ore	100.0	3.57	100.0	1.93	100.0	8.10	100.0	17.1	100.0
	Concentrate	18.4	17.00	87.5	8.08	77.0	16.30	37.0	30.6	32.9
	Tailing	81.6	0.55	12.5	0.55	23.3	6.25	63.0	14.0	67.1

Table 2. Mineral contents and recoveries

DATE	PRODUCT	Weight	Chalcopyrite		Pyrite		Pyrrhotite		Others	
		%	%	Recov.	%	Recov.	%	Recov.	%	Recov.
12.1.90	Ore	100.0	8.0	100.0	28.8	100.0	6.6	100.0	56.6	100.0
	Concentrate	17.4	42.2	91.9	39.5	23.9	2.0	5.2	16.3	5.0
	Tailing	82.6	0.8	8.1	26.6	76.2	7.5	93.8	65.2	95.0
14.1.90	Ore	100.0	10.3	100.0	20.1	100.0	7.2	100.0	62.4	100.0
	Concentrate	18.4	49.1	87.5	24.5	22.4	0.9	2.4	25.4	7.5
	Tailing	81.6	1.6	12.5	19.1	77.6	8.6	97.6	70.7	92.5

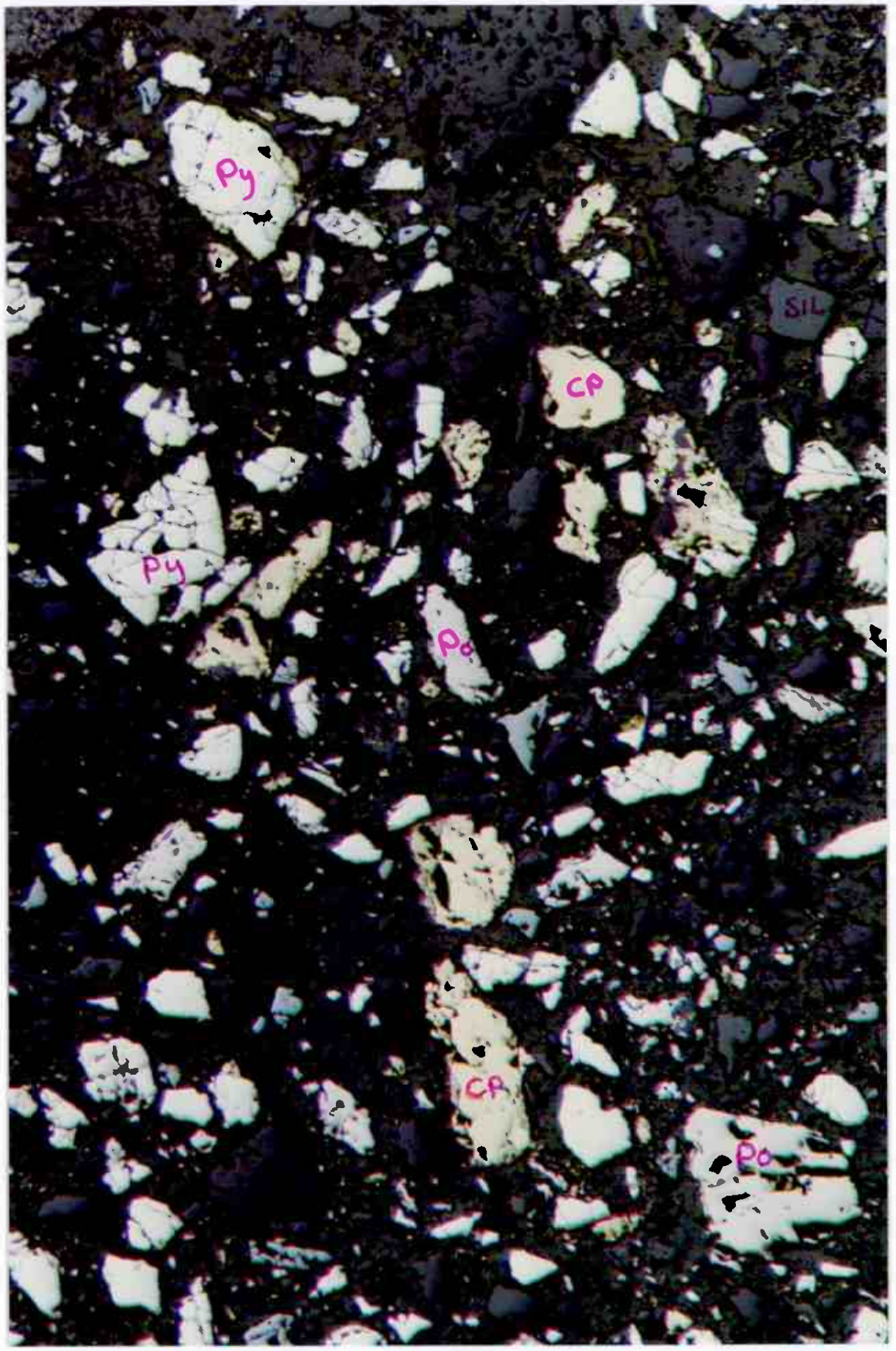

Fig 1. Bidjovagge, ore 12.1.1990 160x
Chalcopyrite(cp), pyrite(py), silicates(sil) and pyrrhotite(po).

Fig 2. Bidjovagge, ore 14.1.1990 160x
Coarse-grained chalcopyrite, pyrite and silicates with some chalcopyrite inclusions in silicates. Very fine-grained sulphides also occur.

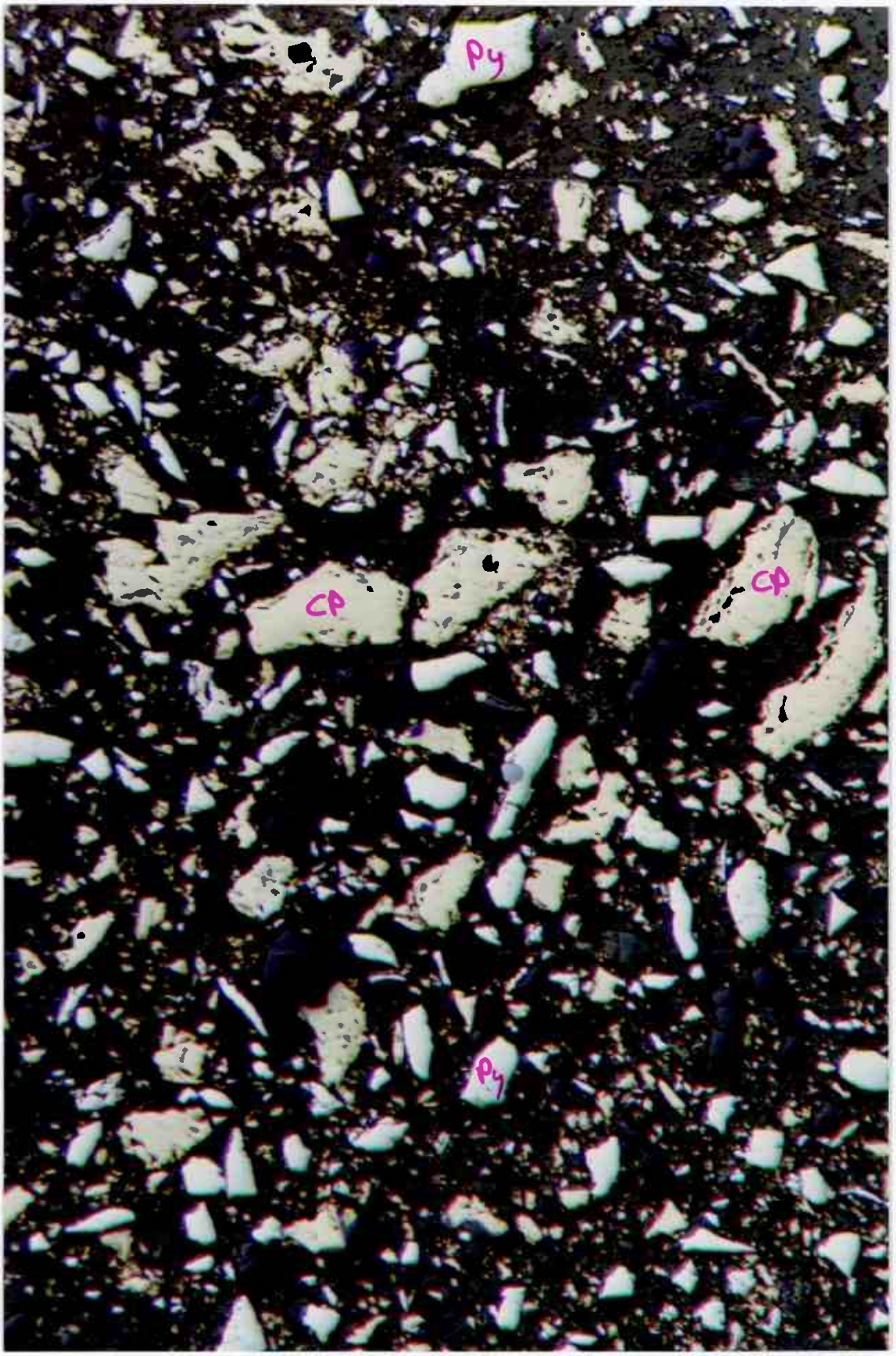

Fig 3. Bidjovagge, concentrate 12.1.1990 160x
Chalcopyrite concentrate rich in pyrite.

100 µm

Fig 4. Bidjovagge, concentrate 14.1.1990 160x
A rather fine-grained chalcopyrite-pyrite concentrate.