

Appendix 5

X-ray diffraction pattern of head samples

QUESTION

1. The following table shows the number of people who attended the

concerts in the city of London in 2018 and 2019.

Year

2018

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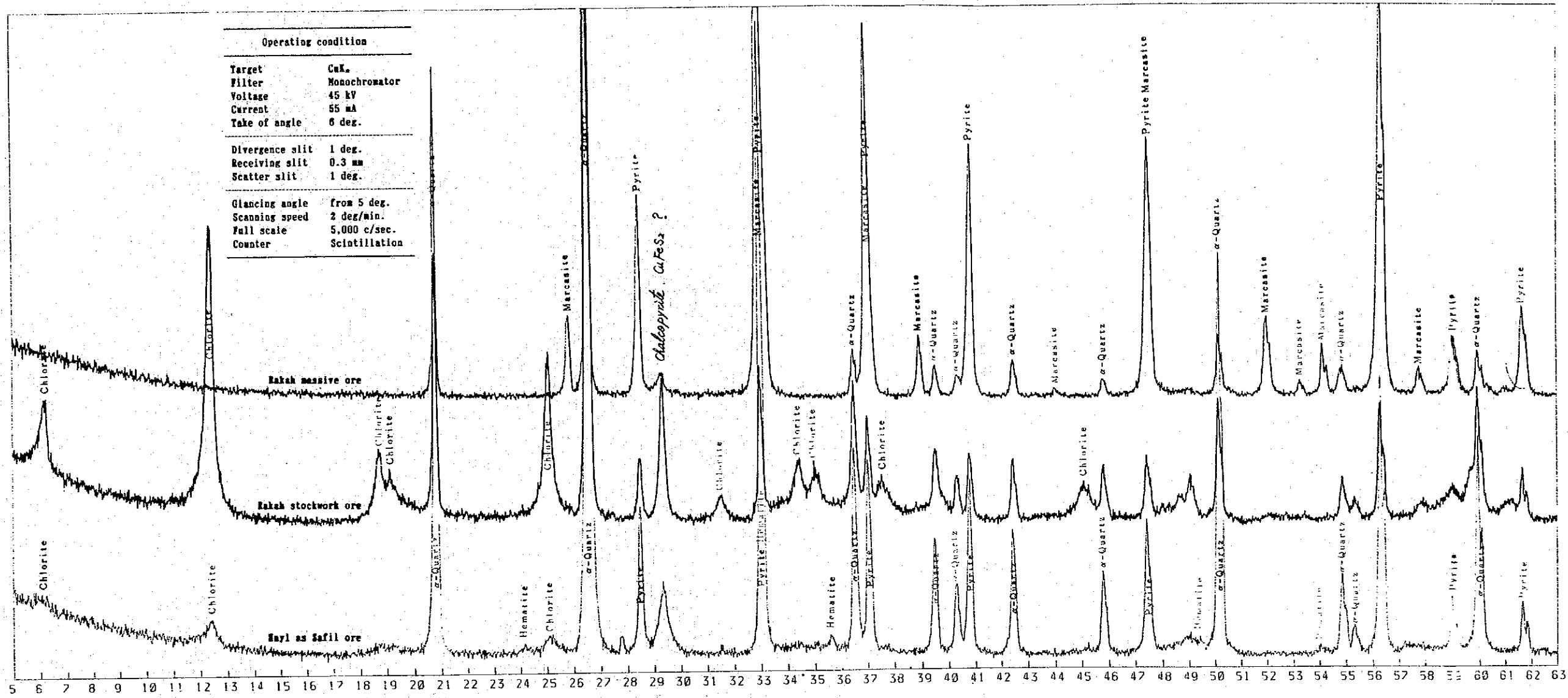
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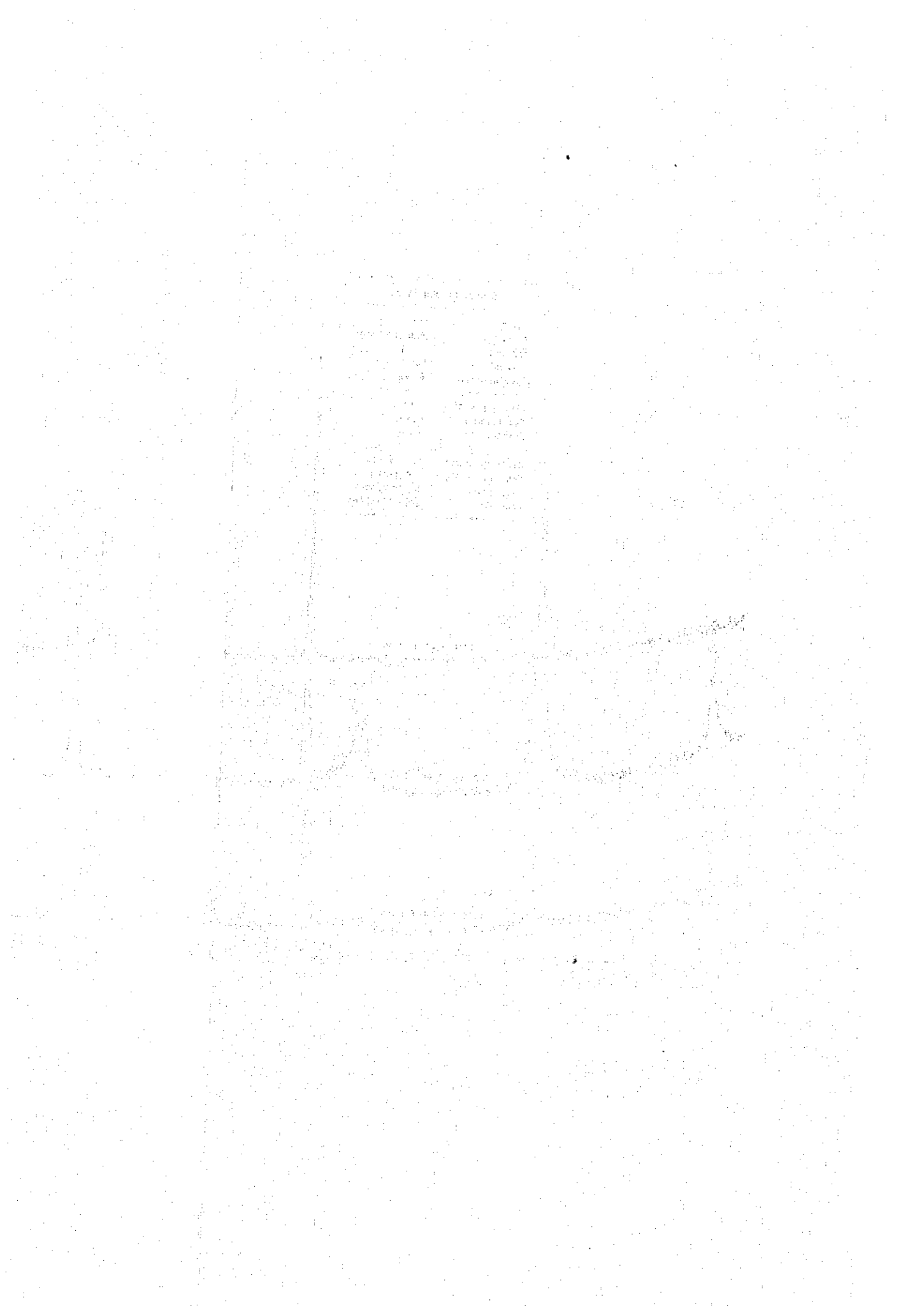
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Appendix 6

Details and results of flotation tests

Introduction

The following text is a placeholder for the main content of the document.

Table 1 Flotation Test Results of Hayl as Safil Ore
- Effect of feed size on copper selective flotation -

TEST No.	OPERATION	CONDITIONS							PROD UCTS	WEIGHT %	ASSAY		DISTRIBUTION					
		Time min.	P.D. %	Size %	Temp °C	Lime g/l	KAX g/l	AF65 g/l			pH Initial	pH Final	Cu %	Fe %	Cu %	Fe %	S %	
1	GRINDING	8	60	50	25	2000	30	27.9	12.1	11.7	C. Head	100.00	1.14	15.73	14.33	100.00	100.00	100.00
	ROUGHER	10	35	50	25	2000	5	9.3	11.7	11.6	C-1	25.99	4.02	36.93	42.22	91.34	61.03	76.56
	SCAVENGER	5									Tail	68.67	0.10	6.23	2.02	2.66	11.77	13.76
2	GRINDING	11	60	60	25	2000	30	27.9	12.0	11.8	C. Head	100.00	1.16	16.10	14.58	100.00	100.00	100.00
	ROUGHER	10	35	60	25	2000	5	9.3	11.8	11.6	C-1	16.03	6.58	36.68	40.65	90.61	36.52	44.69
	SCAVENGER	5								Tail	62.66	0.11	11.86	9.25	1.58	2.58	2.86	52.45
3	GRINDING	13	60	70	26	2000	30	27.9	12.1	11.8	C. Head	100.00	1.16	16.19	14.52	100.00	100.00	100.00
	ROUGHER	10	35	70	26	2000	5	9.3	11.8	11.6	C-1	12.45	8.37	35.04	38.47	89.82	26.95	32.98
	SCAVENGER	5								Tail	86.05	0.11	13.16	10.72	2.02	3.10	3.50	63.52
4	GRINDING	16	60	80	25	2000	30	27.9	12.0	11.6	C. Head	100.00	1.16	16.03	14.31	100.00	100.00	100.00
	ROUGHER	10	35	80	25	2000	5	9.3	11.6	11.3	C-1	11.11	9.30	34.16	38.26	89.42	23.68	29.70
	SCAVENGER	5								Tail	87.03	0.11	13.31	10.80	2.30	4.03	4.64	65.67

Table 2 Flotation Test Results of Hail as Safil Ore
- Effect of KAX on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS										PROD UCITS	WEIGHT %	ASSAY			DISTRIBUTION		
		Time		P. D. Size %	Temp °C	Lime g/l	KAX g/l	AF65 g/l	pH		Cu %			Fe %	S %	Cu %	Fe %	S %	
		min.							Initial	Final									
5	GRINDING	16	60	80	27	860	30	27.9	8.6	8.2	C. Head	100.00	1.16	15.81	14.66	100.00	100.00	100.00	
	ROUGHNER	10	35	80	27	860	5	27.9	8.2	8.1	C-1	15.34	6.07	35.92	41.31	80.14	34.87	43.24	
	SCAVENGER	5			27	860	5	27.9	8.2	8.1	C-2	5.27	2.42	36.42	41.30	10.98	12.15	14.85	
											Tail	79.38	0.13	10.55	7.74	8.88	52.98	41.91	
6	GRINDING	16	60	80	28	1100	30	27.9	9.8	9.0	C. Head	100.00	1.16	16.57	14.62	100.00	100.00	100.00	
	ROUGHNER	10	35	80	28	1100	5	9.3	9.0	8.7	C-1	12.36	7.66	33.91	36.44	81.33	25.30	30.82	
	SCAVENGER	5			28	1100	5	9.3	9.0	8.7	C-2	4.29	2.54	37.68	40.51	9.36	9.76	11.89	
											Tail	83.35	0.13	12.91	10.05	9.31	64.94	57.29	
7	GRINDING	16	60	80	28	1500	30	27.9	10.8	9.7	C. Head	100.00	1.16	16.08	14.67	100.00	100.00	100.00	
	ROUGHNER	10	35	80	28	1500	5	9.3	9.7	9.4	C-1	9.93	9.58	32.40	35.90	82.27	20.01	24.31	
	SCAVENGER	5			28	1500	5	9.3	9.7	9.4	C-2	2.40	2.70	33.03	35.52	5.60	4.92	5.81	
											Tail	87.67	0.16	13.77	11.69	12.13	75.07	63.83	
4	GRINDING	16	60	80	25	2000	30	27.9	12.0	11.6	C. Head	100.00	1.16	16.03	14.31	100.00	100.00	100.00	
	ROUGHNER	10	35	80	25	2000	5	9.3	11.6	11.3	C-1	11.11	9.30	34.16	38.26	89.42	23.68	29.70	
	SCAVENGER	5			25	2000	5	9.3	11.6	11.3	C-2	1.86	1.43	34.79	35.73	2.30	4.03	4.54	
											Tail	87.03	0.11	13.31	10.80	8.29	72.29	65.67	

Table 3 Flotation Test Results of Hail as Safill Ore
- Effect of AP3501 on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS										PROD UCTS	WEIGHTI %	ASSAY			DISIRIBUTION		
		Time		P. D. Size %	Temp °C	Lime g/T	AP3501 g/T	AF65 g/T	PH		Cu %			Fe %	S %	Cu %	Fe %	S %	
		min.							Initial	Final									
8	GRINDING	16	60	80	27	800	46.7	27.9	8.1	7.9	C. Head	100.00	1.18	16.90	14.92	100.00	100.00	100.00	
	ROUGHER	10	35						7.9		C-1	14.28	6.28	38.69	39.74	75.68	31.00	38.02	
	SCAVENGER	5							7.8		C-2	2.07	3.41	32.71	33.45	5.96	4.01	4.64	
										Tail	83.65	0.26	13.13	10.23	18.36	65.00	57.34		
9	GRINDING	16	60	80	28	1000	46.7	27.9	9.2	8.8	C. Head	100.00	1.14	16.57	14.50	100.00	100.00	100.00	
	ROUGHER	10	35						8.8		C-1	12.10	8.19	35.04	37.32	86.68	25.53	31.14	
	SCAVENGER	5							8.6		C-2	2.23	1.83	34.04	34.75	3.58	4.59	5.36	
										Tail	85.67	0.13	13.51	10.75	9.74	69.83	63.51		
10	GRINDING	16	60	80	28	1500	46.7	23.3	11.1	10.2	C. Head	100.00	1.17	17.42	14.84	100.00	100.00	100.00	
	ROUGHER	10	35						10.2		C-1	9.82	10.35	32.66	35.22	86.48	18.41	23.30	
	SCAVENGER	5							9.8		C-2	2.43	1.84	35.17	35.73	3.81	4.92	5.86	
										Tail	87.75	0.13	15.22	11.98	9.71	76.68	70.84		
11	GRINDING	16	60	80	29	2000	46.7	27.9	11.8	11.4	C. Head	100.00	1.19	16.57	14.46	100.00	100.00	100.00	
	ROUGHER	10	35						11.4		C-1	8.53	12.16	32.53	35.09	86.84	16.75	20.70	
	SCAVENGER	5							11.0		C-2	2.20	1.87	35.80	37.52	3.45	4.76	5.71	
										Tail	89.27	0.13	14.57	11.92	9.71	78.49	73.58		

Table 4 Flotation Test Results of Hayl as Safil Ore
 - Effect of AP3418 on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS										PROD UCIS	WEIGHT %	ASSAY			DISTRIBUTION		
		Time min.	P.D. Size %	Temp °C	Lime g/T	AP3418		AF65 g/T	pH Initial	pH Final	Cu %			Fe %	S %	Cu %	Fe %	S %	
						g/T	g/T												
12	GRINDING	16	60	28	980	46.4	27.9	8.1	8.0	C. Head	100.00	1.17	16.05	14.53	100.00	100.00	100.00		
	ROUGHER	10	35	80		7.7	9.3	8.0	8.0	C-1	10.59	7.71	35.83	40.23	69.93	23.63	29.32		
	SCAVENGER	5								C-2	1.58	3.87	32.00	32.73	5.23	3.15	3.56		
	Tail									Tail	87.84	0.33	13.38	11.10	24.84	73.22	67.12		
13	GRINDING	16	60	29	1140	46.4	27.9	9.2	8.7	C. Head	100.00	1.18	16.42	14.73	100.00	100.00	100.00		
	ROUGHER	10	35	80		7.7	9.3	8.7	8.6	C-1	8.10	9.78	33.32	36.67	67.25	16.44	20.18		
	SCAVENGER	5								C-2	2.00	4.47	32.98	34.05	7.58	4.01	4.52		
	Tail									Tail	89.90	0.33	14.53	12.32	25.17	79.54	75.20		
14	GRINDING	16	60	28	1400	46.4	27.9	10.7	10.0	C. Head	100.00	1.17	16.31	14.54	100.00	100.00	100.00		
	ROUGHER	10	35	80		7.7	9.3	10.7	10.0	C-1	10.31	9.51	35.88	37.54	83.94	21.43	26.62		
	SCAVENGER	5						10.0	9.7	C-2	2.40	2.35	35.59	38.03	4.86	5.25	6.29		
	Tail									Tail	87.28	0.15	13.70	11.18	11.20	73.32	67.09		
15	GRINDING	16	60	30	2520	46.4	27.9	11.8	11.2	C. Head	100.00	1.15	15.65	14.62	100.00	100.00	100.00		
	ROUGHER	10	35	80		7.7	9.3	11.8	11.2	C-1	12.84	8.03	32.43	38.68	89.42	26.59	33.96		
	SCAVENGER	5						11.2	11.0	C-2	2.90	1.30	34.46	37.71	3.27	6.38	7.48		
	Tail									Tail	84.27	0.10	12.45	10.16	7.31	67.02	58.56		

Table 5 Flotation Test Results of Hayl as Safil Ore
 - Effect of AP404 on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS										PROD UCTS	WEIGHT %	ASSAY			DISTRIBUTION		
		Time min.	P.D. %	Size %	Temp °C	Lime g/l	AF404 g/l	AF65 g/l	PH		Cu %			Fe %	S %	Cu %	Fe %	S %	
									Intial	Final									
16	GRINDING	16	60		28	740	54.1	27.9	8.1	7.9	C. Head	100.00	1.15	15.94	14.89	100.00	100.00	100.00	
	ROUGHER	10	35	80			7.7	9.3	7.9	7.8	C-1	8.35	9.12	33.83	39.03	66.13	17.71	21.88	
	SCAVENGER	5									C-2	2.01	5.11	31.34	34.12	8.94	3.96	4.62	
											Tail	89.64	0.32	13.93	12.21	24.92	78.33	73.51	
17	GRINDING	16	60		28	1000	54.1	27.9	9.2	8.8	C. Head	100.00	1.17	15.81	14.80	100.00	100.00	100.00	
	ROUGHER	10	35	80			7.7	18.6	8.8	8.6	C-1	6.56	12.75	30.60	35.35	71.76	12.70	15.68	
	SCAVENGER	5									C-2	2.32	5.15	32.84	36.21	10.27	4.83	5.69	
											Tail	91.11	0.23	14.31	12.77	17.97	82.47	78.63	
18	GRINDING	16	60		28	1400	54.1	27.9	10.8	10.0	C. Head	100.00	1.17	15.91	14.85	100.00	100.00	100.00	
	ROUGHER	10	35	80			7.7	9.3	10.0	9.6	C-1	7.98	12.01	30.72	35.84	82.19	15.41	19.27	
	SCAVENGER	5									C-2	1.82	2.99	34.20	37.63	4.66	3.91	4.61	
											Tail	90.20	0.17	14.23	12.53	13.15	80.68	76.12	
19	GRINDING	16	60		30	2980	54.1	27.9	11.9	11.4	C. Head	100.00	1.15	15.41	14.36	100.00	100.00	100.00	
	ROUGHER	10	35	80			7.7	9.3	11.4	11.3	C-1	8.23	11.66	29.21	34.71	83.29	15.60	19.90	
	SCAVENGER	5									C-2	1.73	2.80	32.07	34.94	4.20	3.60	4.21	
											Tail	90.04	0.16	13.83	12.10	12.51	80.80	75.89	

Table 6 Flotation Test Results of Hayl as Safill Ore
 - Recovery as a function of flotation time on copper selective flotation varying KAX dosage -

TEST No.	OPERATION	CONDITIONS				AF65 g/T	PH		PROD UCTS	WEIGHT %	ASSAY		DISTRIBUTION	
		Time min.	P.D. %	Size %	Temp °C		Lime g/T	KAX g/T			Initial	Final	Cu %	Fe %
20	GRINDING	16	60	80	31	2080	30	18.6	11.6	C. Head	100.00	15.83	100.00	100.00
	ROUGHEN	3	35							C-1	6.68	31.67	77.16	13.37
		2	4			200		9.3	11.6	C-2	1.84	34.31	6.61	3.99
		3	4			150		9.3	11.5	C-3	1.40	33.83	3.20	3.00
		4	5			150		9.3	11.5	C-4	0.66	31.19	1.26	1.30
		5	5			200	5	9.3	11.6	C-5	0.45	30.71	0.74	0.87
	6	10							C-6	2.55	33.71	3.55	5.42	
									Tail	86.42	13.20	7.48	72.06	
21	GRINDING	16	60	80	30	2050	40	18.6	11.6	C. Head	100.00	15.31	100.00	100.00
	ROUGHEN	3	35							C-1	10.44	33.79	76.99	23.03
		2	3							C-2	2.22	32.79	7.43	4.75
		3	4			100		9.3	11.4	C-3	1.66	30.54	4.28	3.30
		4	5			100		9.3	11.4	C-4	0.77	27.53	1.58	1.38
		5	5			100		9.3	11.4	C-5	0.71	25.78	1.21	1.19
	6	10			100	5	9.3	11.4	C-6	2.45	30.54	3.41	4.89	
									Tail	81.77	11.51	5.10	61.46	

Table 7 - Flotation Test Results of Hayl as Safil Ore
- Effect of feed size on bulk flotation -

TEST No.	OPERATION	CONDITIONS				PROD UCITS	WEIGHT %	ASSAY			DISTRIBUTION						
		Time min.	P.D. Size %	Temp °C	Lime g/l			KAX g/l	AF65 g/l	pH Initial	pH Final	Cu %	Fe %	S %	Cu %	Fe %	S %
22	GRINDING ROUGHER- SCAVEN- GEN	8	60	29	620	30	37.2	7.2	7.4	C. Head	100.00	1.16	15.99	15.56	100.00	100.00	100.00
		10	35	50		5	9.3	7.4	7.5	C-1	32.74	2.99	36.05	42.01	84.45	73.81	88.42
		5								C-2	3.17	2.45	20.71	20.45	6.71	4.11	4.17
										Tail	64.08	0.16	5.51	1.80	8.84	22.08	7.41
23	GRINDING ROUGHER- SCAVEN- GEN	11	80	29	880	30	37.2	7.2	7.4	C. Head	100.00	1.18	15.97	15.47	100.00	100.00	100.00
		10	35	60		5	18.6	7.4	7.4	C-1	29.51	3.16	36.91	43.02	78.83	68.20	82.89
		5								C-2	3.87	2.68	23.14	22.66	8.78	5.61	5.68
										Tail	66.61	0.22	6.28	2.84	12.39	26.19	12.23

Table 9 Flotation Test Results of Hayl as Safil Ore
 - Recovery as a function of flotation time on bulk flotation varying KAX dosage -

TEST ND.	OPER ATION	CONDITIONS				PROD UCTS	WEIGHT %	ASSAY			DISTRIBUTION							
		Time min.	P.D. %	Size %	Temp °C			Lime g/I	KAX g/I	AF65 g/I	pH Initial	pH Final	Cu %	Fe %	S %	Cu %	Fe %	S %
1	GRINDING	8	60	50	25	2000	30	27.9	12.1	11.7	C. Head	100.00	1.14	15.73	14.33	100.00	100.00	100.00
	ROUGHER	10	35	50	25	2000	5	9.3	11.7	11.6	C-1	25.99	4.02	36.93	42.22	91.34	61.03	76.56
	SCAVEN- GER	5									Tail	68.67	0.57	34.67	36.93	2.66	11.77	13.78
27	GRINDING	8	60	50	32	2000	40	37.2	11.6	10.8	C. Head	100.00	1.16	15.77	14.84	100.00	100.00	100.00
	ROUGHER	10	35	50	32	2000	10	9.3	11.4	10.7	C-1	26.22	3.95	36.95	42.83	89.18	61.41	76.71
	SCAV'ER1 SCAV'ER2	10 10				200 200	10 10	18.6	11.3	10.5	C-2 C-3 Tail	8.82 3.75 61.22	0.80 0.49 0.06	28.79 12.36 5.04	31.09 10.31 0.46	6.08 1.58 3.16	16.10 2.94 19.56	18.73 2.64 1.92

Table 10 Flotation Test Results of Hayl as Safil Ore
 - Effect of pH value and KAX dosage on bulk rougher/cleaner flotation -

TEST No.	OPER AIIION	CONDITIONS										PROD UCTS	WEIGHT %	ASSAY		DISTRIBUTION		
		Time min.	P.D. %	Size %	Temp °C	Lime g/l	KAX g/l	AF65 g/l	PH Initial	PH Final	Cu %			Fe %	Cu %	Fe %	S %	
28	GRINDING	8	60	50	31	2400	60	65.1	11.6	11.0	C. Head	100.00	1.13	15.84	100.00	100.00	14.47	100.00
	ROUGHER	30	35	50	31	2400	60	65.1	11.6	11.0	R-C	39.55	2.77	32.70	96.80	81.65	36.10	98.56
	REGRINDING	6									IC-C	16.91	5.44	40.13	81.21	42.82	46.70	54.55
	1CLEANER	5	15	90	26	200	2		10.6	9.7	IC-M	22.65	0.78	27.16	15.59	38.83	28.19	44.11
	2CLEANER	4	18		25	50			10.4	9.8	Conc	13.90	5.90	40.55	72.34	35.57	47.49	45.60
											Tail	60.45	3.34	38.17	8.87	7.25	43.05	8.95
													0.06	4.81	3.20	18.35	0.32	1.34
29	GRINDING	8	60	50	30	2300	60	65.1	11.6	11.0	C. Head	100.00	1.14	15.96	100.00	100.00	14.50	100.00
	ROUGHER	30	35	50	30	2300	60	65.1	11.6	11.0	R-C	40.20	2.74	32.70	96.85	82.35	35.59	98.68
	REGRINDING	6									IC-C	14.64	6.47	39.54	83.15	36.26	45.38	45.81
	1CLEANER	5	15	90	26	300	2		11.4	11.0	IC-M	25.56	0.61	28.78	13.70	46.09	29.99	52.87
	2CLEANER	4	15		26	200			11.4	11.2	Conc	10.88	7.54	39.67	72.04	27.03	45.75	34.32
											Tail	59.80	3.36	39.17	11.11	9.23	44.31	11.50
													0.06	4.71	3.15	17.65	0.32	1.32
30	GRINDING	8	60	50	32	2400	60	74.4	11.4	10.9	C. Head	100.00	1.12	15.91	100.00	100.00	14.57	100.00
	ROUGHER	30	35	50	32	2400	60	74.4	11.4	10.9	R-C	41.56	2.62	31.60	97.39	82.52	34.46	98.28
	REGRINDING	6									IC-C	9.88	9.61	35.41	84.91	21.98	42.52	28.82
	1CLEANER	5	16	90	27	2000	2		12.3	12.2	IC-M	31.68	0.44	30.41	12.48	60.54	31.95	69.46
	2CLEANER	4	11		26	500			12.3	12.2	Conc	6.45	12.76	34.54	73.65	14.00	42.60	18.85
											Tail	58.44	3.67	37.04	11.26	7.98	42.37	9.96
													0.05	4.76	2.61	17.48	0.43	1.72
31	GRINDING	8	60	50	33	2600	60	55.8	11.6	10.9	C. Head	100.00	1.15	15.93	100.00	100.00	14.56	100.00
	ROUGHER	30	35	50	33	2600	60	55.8	11.6	10.9	R-C	39.68	2.82	32.69	96.87	81.41	36.01	98.14
	REGRINDING	8									IC-C	9.77	9.89	35.44	83.66	21.74	42.79	28.72
	1CLEANER	5	15	95	27	1200	2		12.0	11.8	IC-M	29.90	0.51	31.79	13.21	59.67	33.79	69.41
	2CLEANER	4	11		28	600			12.0	11.9	Conc	7.84	11.69	34.97	79.38	17.21	42.98	23.15
											Tail	60.32	2.56	37.37	4.28	4.53	42.00	5.57
													0.06	4.91	3.13	18.59	0.45	1.86

Table 11 Flotation Test Results of Rakah Stockwork Ore
- Effect of feed size on copper selective flotation -

TEST No.	OPER ATION	CONDITIONS						PROD UCITS	WEIGHI %	ASSAY			DISTRIBUION		
		Time min.	P.D. Size %	Temp °C	Lime g/T	KAX g/T	AF65 g/T			PH Intial	PH Final	Cu %	Fe %	S %	Cu %
32	GRINDING	9	60					C. Head	100.00	1.25	19.89	9.62	100.00	100.00	100.00
	ROUGHER	10	35	27	2000	25	27.9	C-1	20.81	5.55	36.44	38.37	92.48	38.13	82.98
	SCAVENGER	5				5	9.3	C-2	2.80	1.17	30.70	26.31	2.62	4.32	7.66
								Tail	76.39	0.08	14.98	1.18	4.89	57.55	9.37
33	GRINDING	11	60					C. Head	100.00	1.25	20.11	9.54	100.00	100.00	100.00
	ROUGHER	10	35	27	2000	25	27.9	C-1	18.54	6.16	37.46	39.57	91.48	34.54	76.95
	SCAVENGER	5				5	9.3	C-2	2.85	1.53	34.65	31.95	3.49	4.90	9.53
								Tail	78.61	0.08	15.49	1.64	5.04	60.56	13.52
34	GRINDING	13	60					C. Head	100.00	1.28	20.14	9.72	100.00	100.00	100.00
	ROUGHER	10	35	27	2000	25	27.9	C-1	17.39	6.84	37.58	39.97	93.23	32.47	71.53
	SCAVENGER	5				5	9.3	C-2	1.62	1.33	34.53	31.84	1.69	2.78	5.31
								Tail	80.98	0.08	16.10	2.78	5.08	64.75	23.16
35	GRINDING	16	60					C. Head	100.00	1.25	20.05	9.71	100.00	100.00	100.00
	ROUGHER	10	35	27	2000	25	27.9	C-1	14.29	8.24	37.20	39.60	94.04	26.51	58.27
	SCAVENGER	5				5	4.7	C-2	1.63	0.97	33.38	28.90	1.26	2.71	4.85
								Tail	84.08	0.07	16.88	4.26	4.70	70.78	36.88

Table 14. Flotation Test Results of Rakah Stockwork Ore
 - Effect of AP3418 on copper selective flotation varying pH value -

TEST No.	OPER AIIION	CONDITIONS						PROD UCITS	WEIGHT %	ASSAY			DISTRIBUTION		
		Time min.	P. D. Size %	Temp °C	Lime g/T	AF65 g/T				Cu %	Fe %	S %	Cu %	Fe %	S %
						AP3418	Final								
43	GRINDING	16	60					C. Head	100.00	1.26	20.29	9.73	100.00	100.00	100.00
	ROUGHER	10	35	28	1500	38.7	27.9	9.4	8.8	7.14	36.32	38.39	93.75	29.52	65.07
	SCAVENGER	5				7.7	9.3	8.8	8.7	0.73	37.81	38.06	2.47	7.91	16.60
44	GRINDING	16	60					C. Head	100.00	1.26	21.23	9.46	100.00	100.00	100.00
	ROUGHER	10	35	29	2000	38.7	27.9	10.3	9.6	9.09	34.18	34.77	94.65	21.07	48.11
	SCAVENGER	5				7.7	9.3	9.6	9.4	0.58	36.54	34.49	1.34	5.00	10.59
45	GRINDING	16	60					C. Head	100.00	1.24	19.57	9.67	100.00	100.00	100.00
	ROUGHER	10	35	27	3400	38.7	18.6	12.0	11.6	12.89	28.71	28.90	94.64	13.41	27.30
	SCAVENGER	5				7.7	9.3	11.6	11.4	1.41	28.51	22.60	1.02	1.32	2.11
46	GRINDING	16	60					C. Head	100.00	1.27	21.53	9.55	100.00	100.00	100.00
	ROUGHER	10	35	29	2000	30.9	27.9	10.6	9.8	9.58	35.42	35.39	93.45	20.36	45.87
	SCAVENGER	5				7.7	9.3	9.8	9.6	0.58	40.07	37.94	1.19	4.84	10.33
								Tail	85.02	0.08	18.94	4.92	5.36	74.80	43.81

Table 15 Flotation Test Results of Rakah Stockwork Ore
- Effect of AP404 on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS										PROD UCTS	WEIGHT %	ASSAY			DISTRIBUTION		
		Time		P. D. Size %	Temp °C	Lime g/T	AP404 g/T	AF65 g/T	pH		Cu %			Fe %	S %	Cu %	Fe %	S %	
		min.	%						Initial	Final									
47	GRINDING	16	60		28	820	38.7	18.6	8.0	7.7	C. Head	100.00	1.28	19.56	10.09	100.00	100.00	100.00	
	ROUGHER	10	35	80							C-1	16.58	7.14	36.39	40.43	92.72	30.84	66.45	
	SCAVENGER	5										79.94	0.83	34.50	33.79	2.27	6.15	11.67	
48	GRINDING	16	60		29	1500	38.7	27.9	9.3	8.7	C. Head	100.00	1.24	19.59	9.77	100.00	100.00	100.00	
	ROUGHER	10	35	80							C-1	11.65	9.94	33.83	36.63	93.02	20.12	43.67	
	SCAVENGER	5									86.21	0.84	34.84	33.68	1.44	3.80	7.36		
49	GRINDING	16	60		28	2620	38.7	23.3	11.0	10.2	C. Head	100.00	1.26	19.50	9.87	100.00	100.00	100.00	
	ROUGHER	10	35	80							C-1	7.59	15.14	29.85	32.89	91.33	11.62	25.29	
	SCAVENGER	5									91.13	2.11	31.84	29.93	2.15	2.09	3.89		
50	GRINDING	16	60		29	2000	30.9	27.9	10.8	10.0	C. Head	100.00	1.25	20.11	9.36	100.00	100.00	100.00	
	ROUGHER	10	35	80							C-1	8.45	13.52	31.65	28.82	91.26	13.30	26.01	
	SCAVENGER	5									89.97	1.80	31.02	26.23	2.27	2.44	4.42		
												0.09	18.84	7.24	6.47	84.27	69.56		

Table 17 Flotation Test Results of Rakah Stockwork Ore
- Effect of feed size on bulk flotation -

TEST No.	OPERATION	Time			D. Size %	Temp °C	CONDITIONS			PROD UCITS	WEIGHT %	ASSAY			DISTRIBUTION		
		min.	%	%			Lime g/T	KAX g/T	AF65 g/T			Initial	Final	pH	Cu %	Fe %	S %
53	GRINDING	9	60							C. Head	100.00	1.20	20.20	10.28	100.00	100.00	100.00
	ROUGHER	10	35	50	27	25	27.9	7.0	7.1	C-1	24.59	4.57	36.93	35.72	93.28	44.96	85.49
	SCAVENGER	5				5	9.3	7.1	7.2	C-2 Tail	2.29 73.12	0.98 0.08	23.49 14.47	14.04 1.60	1.86 4.86	2.66 52.38	3.13 11.38
54	GRINDING	11	60							C. Head	100.00	1.25	19.89	9.44	100.00	100.00	100.00
	ROUGHER	10	35	60	26	25	27.9	7.0	7.2	C-1	20.64	5.52	36.57	37.54	90.95	37.95	82.10
	SCAVENGER	5				5	9.3	7.2	7.3	C-2 Tail	3.49 75.87	1.29 0.09	27.11 15.02	19.70 1.32	3.59 5.45	4.76 57.29	7.29 10.61

Table 23 Flotation Test Results of Rakah Massive Ore
- Effect of KAX dosage on copper selective flotation -

TEST No.	OPER ALLION	CONDITIONS						PROD UCITS	WEIGHT %	ASSAY		DISTRIBUTION			
		Time min.	P.D. %	Size %	Temp °C	Lime g/T	KAX g/T			AF65 g/T	PH Initial	PH Final	Cu %	Fe %	S %
66	GRINDING	16	50		12500			C. Head	100.00	1.63	37.17	41.56	100.00	100.00	100.00
	ROUGHER	10	20	94	5625	200	46.4	C-1	30.96	1.54	44.23	49.49	29.29	36.84	36.87
	SCAV'ER1	5						C-2	4.71	3.17	42.43	47.07	9.18	5.38	5.34
	SCAV'ER2	5			250	50	11.6	10.8	3.10	3.82	40.75	45.82	7.27	3.40	3.42
	SCAV'ER3	10			250	50	11.6	10.9	14.38	1.97	42.67	48.38	17.41	16.51	16.74
								Tail	46.85	1.28	30.05	33.38	36.85	37.87	37.63
71	GRINDING	16	50		20000			C. Head	100.00	1.62	36.45	42.41	100.00	100.00	100.00
	ROUGHER	10	20	94	1175	150	34.8	C-1	21.66	3.31	41.51	48.62	44.20	24.67	24.83
	SCAV'ER1	10			250	50	23.2	10.8	7.28	2.82	41.39	47.49	12.66	8.27	8.15
	SCAV'ER2	10			500	50	34.8	10.8	25.02	1.03	42.95	50.12	15.89	28.48	29.57
									Tail	46.04	0.96	29.75	34.50	27.25	37.58
72	GRINDING	16	50		17500			C. Head	100.00	1.61	36.54	41.91	100.00	100.00	100.00
	ROUGHER	10	20	94	700	100	46.4	C-1	9.97	4.90	39.79	46.70	30.24	10.83	11.10
	SCAV'ER1	5			250	50	11.6	10.8	5.16	3.93	39.79	45.75	12.57	5.62	5.64
	SCAV'ER2	5			250	50	23.2	10.9	3.54	3.21	39.79	45.99	7.05	3.86	3.89
	SCAV'ER3	10							19.50	1.52	42.19	48.69	18.36	22.51	22.65
								Tail	61.83	0.83	33.78	38.45	31.78	57.15	56.72
73	GRINDING	30	50		20000			C. Head	100.00	1.64	36.77	41.73	100.00	100.00	100.00
	ROUGHER	10	20	>99	900	100	34.8	C-1	7.64	4.29	39.78	44.91	19.98	8.27	8.23
	SCAV'ER1	5			250	20	11.6	10.8	3.00	4.89	38.99	43.97	8.95	3.18	3.16
	SCAV'ER2	5			500	20	23.2	11.1	2.10	4.53	38.39	44.14	5.80	2.19	2.22
	SCAV'ER3	10							6.76	4.06	39.71	44.96	16.72	7.30	7.28
								Tail	80.49	0.99	36.11	41.01	48.56	79.05	79.11

Table 24 Flotation Test Results of Rakah Massive Ore
- Effect of MAX on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS										PROD UCITS	WEIGHT					ASSAY					DISTRIBUTION				
		Time		D. Size	Temp	Lime	KAX	AF85	PH		Au		Ag	Cu	Fe	S	Au	Ag	Cu	Fe	S	Au	Ag	Cu	Fe	S	
		min.	%						Initial	Final																	g/t
74	GRINDING ROUGHEN SCAVEN- GER	16	50	15000		100	69.6	7.8	7.8	11.41	6.52	1.64	37.00	41.85	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		
		20	20	725		50	23.2	7.8	7.8	13.34	5.07	2.01	42.05	48.27	47.71	31.74	50.10	46.37	47.05	47.05	42.07	24.68	27.33	45.66	45.53		
		10								12.23	4.10	1.14	43.05	48.57	42.07	24.68	27.33	45.66	45.53	42.07	24.68	27.33	45.66	45.53			
										19.96	14.23	1.85	14.77	15.56	10.22	43.58	22.56	7.97	7.42								
75	GRINDING ROUGHEN SCAVEN- GEN	16	50	17500		100	58	9.3	9.0	10.28	4.23	1.62	36.67	42.02	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		
		20	20			50	11.6	9.0	8.9	13.44	6.51	3.47	39.05	43.40	18.02	21.23	29.44	14.68	14.24	18.02	21.23	29.44	14.68	14.24			
		10								16.12	7.00	3.54	40.30	46.01	18.01	19.01	25.02	12.62	12.57	18.01	19.01	25.02	12.62	12.57			
										74.73	3.38	0.99	35.67	41.15	63.97	59.76	45.54	72.70	73.13	63.97	59.76	45.54	72.70	73.13			
76	GRINDING ROUGHEN SCAV'ER1 SCAV'ER2	16	50	20000		100	46.4	10.4	10.3	9.48	7.90	1.65	35.82	42.76	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		
		10	20			50	23.2	10.2	10.0	13.77	5.89	3.83	39.59	47.77	26.28	13.48	41.96	19.99	20.20	26.28	13.48	41.96	19.99	20.20			
		10								12.84	6.08	3.29	40.31	47.63	6.34	3.59	9.29	5.19	5.19	6.34	3.59	9.29	5.19	5.19			
		10								9.64	3.16	1.29	42.47	50.60	17.58	6.91	13.51	20.46	20.46	17.58	6.91	13.51	20.46	20.46			
72	GRINDING ROUGHEN SCAV'ER1 SCAV'ER2	16	50	17500		100	46.4	11.0	10.9	7.87	10.02	0.97	32.42	38.61	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		
		10	20			50	23.2	10.9	10.9	18.38	6.54	4.90	39.79	46.70	17.27	18.82	30.24	19.85	11.10	17.27	18.82	30.24	19.85	11.10			
		10								14.71	6.58	3.64	39.79	45.85	20.10	20.33	18.36	22.51	22.51	20.10	20.33	18.36	22.51	22.51			
		10								8.67	2.48	0.83	33.76	38.45	50.55	44.23	31.78	57.15	56.72	50.55	44.23	31.78	57.15	56.72			

Table 25 Flotation Test Results of Rakah Massive Ore
- Effect of AP3501 on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS				PROD UCITS	WEIGHT %	ASSAY				DISTRIBUTION								
		Time min.	P.D. Size %	Temp °C	Lime g/T			AF65 g/T	pH Initial	pH Final	Au g/t	Ag g/t	Cu %	Fe %	S %	Au %	Ag %	Cu %	Fe %	S %
77	GRINDING	16	50	29	15000	69.6	7.5	7.7	11.87	4.48	1.66	36.60	42.07	100.00	100.00	100.00	100.00	100.00		
	ROUGHER	20	20		575	153.3	7.7	7.7	14.08	3.86	2.04	41.55	48.22	53.96	38.57	55.03	50.80	51.29		
	SCAVENGER	10				34.8	7.7	7.7	11.31	2.65	1.12	42.43	48.98	33.68	20.58	23.48	40.31	40.48		
	GER							7.01	6.93	1.74	15.89	16.89	12.36	40.86	21.49		8.90	8.23		
78	GRINDING	16	50	28	15000	69.6	9.4	9.3	10.09	4.20	1.63	36.50	43.77	100.00	100.00	100.00	100.00	100.00		
	ROUGHER	20	20		1975	153.3	9.4	9.3	13.77	4.74	2.28	41.67	49.67	25.30	20.46	25.92	21.16	21.04		
	SCAVENGER	10			125	51.1	9.3	9.1	13.77	6.09	2.37	41.93	51.06	26.19	27.20	27.88	22.04	22.38		
	GER							7.86	3.61	1.21	33.29	39.77	48.51	52.34	46.20		56.80	56.58		
79	GRINDING	16	50	28	17500	46.4	10.2	9.9	10.80	3.64	1.65	35.86	43.38	100.00	100.00	100.00	100.00	100.00		
	ROUGHER	20	20		800	153.3	10.4	10.1	17.41	6.09	3.72	38.80	47.83	33.73	34.97	47.18	22.64	23.07		
	SCAVENGER	10			376	51.1	10.4	10.1	11.99	5.19	2.34	40.17	47.76	10.15	13.03	12.97	10.24	10.07		
	GER							8.67	2.71	0.94	34.42	41.48	56.12	52.00	39.84		67.12	66.86		
80	GRINDING	16	50	29	20000	46.4	11.2	11.1	10.70	4.35	1.63	36.32	43.79	100.00	100.00	100.00	100.00	100.00		
	ROUGHER	20	20		1625	153.3	11.1	11.0	17.82	7.67	3.72	39.30	48.29	37.02	39.20	50.73	24.06	24.52		
	SCAVENGER	10			250	51.1	11.1	11.0	13.20	5.64	2.36	40.55	48.36	9.34	9.82	10.96	8.46	8.36		
	GER							8.18	3.16	0.89	34.92	41.87	53.64	50.98	38.31		67.48	67.11		
81	GRINDING	16	50	31	20000	34.8	11.4	10.8	6.53	2.98	1.62	35.98		100.00	100.00	100.00	100.00	100.00		
	ROUGHER	10	20		1075	102.2	11.4	10.8	17.39	6.93	4.67	38.87		31.93	27.83	34.57	12.95			
	SCAVENGER	10			250	11.6	11.2	11.2	11.66	5.88	3.10	39.46		11.26	12.44	12.07	6.91			
	GER				500	51.1	11.2	11.2	6.66	4.62	2.40	39.34		8.75	13.30	12.71	9.38			
	GER							4.29	1.89	0.90	34.81		48.06	46.38	40.64		70.76			

Table 26 Flotation Test Results of Rakah Massive Ore
- Effect of AP3418 on copper selective flotation varying pH value -

TEST No.	OPER ATION	CONDITIONS					PROD UCTS	WEIGHT %	ASSAY				DISTRIBUTION									
		Time min.	P. D. %	Size %	Temp °C	Lime g/T			AP3418 g/T	AF65 g/T	pH Initial	pH Final	Au g/t	Ag g/t	Cu %	Fe %	S %	Au %	Ag %	Cu %	Fe %	S %
82	GRINDING	16	50	94	29	15000	46.4	7.4	7.6	10.90	3.66	1.65	36.85	42.22	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
	ROUGHER	20	20	94	29	500	154.6	48.4	7.6	12.32	3.14	1.78	42.55	48.68	56.69	43.05	54.07	57.92	57.84	57.84	57.84	
	SCAVEN-GER	10	20	94	29	48.3	23.2	7.6	7.6	12.14	2.65	1.41	41.55	48.41	28.45	18.50	21.81	28.80	29.30	29.30	29.30	
83	GRINDING	16	50	94	28	15000	48.3	9.4	8.9	8.90	2.48	0.80	31.79	36.49	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
	ROUGHER	20	20	94	28	1975	154.6	8.9	8.9	11.40	3.81	2.20	41.80	48.44	31.12	33.32	44.13	32.28	32.40	32.40	32.40	
	SCAVEN-GER	10	20	94	28	250	48.3	9.2	8.9	12.69	3.84	1.95	41.55	48.30	22.15	22.66	25.01	20.51	20.65	20.65	20.65	
84	GRINDING	16	50	94	29	17500	58	10.2	9.8	10.43	2.69	1.62	35.40	41.98	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
	ROUGHER	20	20	94	29	1325	154.6	9.8	9.8	17.42	3.84	3.70	39.42	45.45	29.70	25.37	40.53	19.81	19.26	19.26	19.26	
	SCAVEN-GER	10	20	94	29	375	48.3	10.4	9.8	13.15	3.61	2.53	39.92	46.18	14.17	15.06	17.51	12.67	12.36	12.36	12.36	
85	GRINDING	16	50	94	30	20000	46.4	11.2	11.0	11.08	4.96	1.62	35.79	42.39	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
	ROUGHER	20	20	94	30	1500	154.6	11.2	11.0	16.86	5.64	3.16	40.30	48.74	41.91	31.28	59.81	31.01	31.66	31.66	31.66	
	SCAVEN-GER	10	20	94	30	250	48.3	11.1	10.8	12.14	4.51	1.88	40.30	48.50	11.27	9.34	11.96	11.58	11.76	11.76	11.76	
86	GRINDING	16	50	94	30	20000	34.8	11.4	11.0	8.70	2.88	1.63	35.68	38.57	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
	ROUGHER	10	20	94	30	800	106.3	11.4	11.0	10.23	4.83	4.32	38.15	48.74	17.21	24.56	38.76	15.64	15.64	15.64	15.64	
	SCAV' ERZ	10	20	94	30	250	48.3	11.2	11.0	10.88	4.83	2.82	39.11	48.74	8.03	10.78	11.11	7.04	7.04	7.04	7.04	
87	GRINDING	16	50	94	30	20000	34.8	11.0	11.0	8.44	2.10	0.80	34.34	38.57	86.13	51.24	38.75	67.55	67.55	67.55	67.55	
	ROUGHER	10	20	94	30	250	48.3	11.0	11.0	10.88	4.41	2.12	39.82	48.74	6.62	13.42	11.38	9.77	9.77	9.77	9.77	
	SCAV' ERZ	10	20	94	30	250	48.3	11.0	11.0	10.88	4.41	2.12	39.82	48.74	6.62	13.42	11.38	9.77	9.77	9.77	9.77	

Table 28 Flotation Test Results of Rakah Massive Ore
 - Recovery as a function of flotation time on copper selective flotation -

TEST No.	OPER ATION	CONDITIONS				PROD UCIS	WEIGHT %	ASSAY				DISTRIBUTION									
		Time min.	P. D. Size %	Temp °C	Lime g/T			KAX g/T	AF65 g/T	PH Initial	PH Final	Au g/t	Ag g/t	Cu %	Fe %	S %	Au %	Ag %	Cu %	Fe %	S %
91	GRINDING ROUGHER	16	50	29000	100	34.8	11.3	C-Head	100.00	8.03	5.89	1.63	35.74	41.47	100.00	100.00	100.00	100.00	100.00	100.00	100.00
		10	20	1100	100	11.6	11.3	C-1	9.02	10.59	7.35	4.89	38.03	44.68	11.82	11.25	27.00	9.60	9.72	9.72	
		3	10	500	20	23.2	23.2	C-2	4.34	15.10	6.51	5.05	37.19	43.28	8.16	4.79	13.42	4.52	4.53	4.53	
		4	10	250	20	23.2	23.2	C-3	6.09	14.24	4.20	3.67	38.87	44.79	10.80	4.34	13.68	5.62	6.58	6.58	
		5	10	250	20	23.2	23.2	C-4	5.01	7.23	3.78	2.57	40.07	44.90	4.51	3.21	7.88	5.61	5.42	5.42	
		6	10	500	20	11.6	11.6	C-5	5.39	4.79	2.73	1.78	39.83	45.87	2.93	2.49	5.86	6.00	6.11	6.11	
		7	10	250	20	11.6	11.6	C-6	9.86	4.37	2.52	1.33	40.91	47.06	3.21	3.30	4.38	6.16	11.72	11.72	
		8	10	500	50	34.8	34.8	C-7 Tail	24.99	9.66	1.68	0.45	43.55	50.72	30.05	7.12	6.88	30.45	30.56	30.56	30.56
							29.93	6.20	12.01	0.89	23.04	26.88	23.10	60.98	16.31	19.29	19.40	19.40	19.40		

Table 29 Flotation Test Results of Rahah Massive Ore
- Effect of feed size and pH value on bulk flotation -

TEST No.	OPERATION	CONDITIONS					PROD UCITS	WEIGHT %	ASSAY				DISTRIBUTION								
		Time min.	P. D. Size %	Temp °C	Lime g/T	KAX g/T			AF65 g/T	pH Initial	pH Final	Au g/t	Ag g/t	Cu %	Fe %	S %	Au %	Ag %	Cu %	Fe %	S %
92	GRINDING	4.5	50	30	12500	250	69.6	8.3	8.0	C. Head	100.00	10.17	5.43	1.62	35.68	42.29	100.00	100.00	100.00	100.00	100.00
	ROUCHER	20	20		2900	50	34.8	8.0	8.0	C-1	72.80	11.01	3.86	1.59	42.43	49.02	78.94	51.78	71.62	84.22	84.38
	SCAVENGER	10						8.0	8.0	C-2 Tail	7.47 19.73	12.79 6.02	5.07 11.34	2.10 1.33	35.17 15.64	41.12 17.91	9.39 11.67	6.98 41.23	9.71 18.67	7.37 8.41	7.26 8.35
93	GRINDING	4.5	50	29	15000	250	69.6	9.2	8.0	C. Head	100.00	11.62	5.89	1.57	36.34	42.76	100.00	100.00	100.00	100.00	100.00
	ROUCHER	20	20		2125	50	23.2	8.8	8.8	C-1	57.10	13.34	3.62	1.63	41.67	49.08	77.00	41.23	69.51	76.94	77.01
	SCAVENGER	10			125			8.8	8.8	C-2 Tail	8.12 24.78	10.01 7.51	4.34 12.55	1.70 1.37	38.67 21.15	44.51 25.09	6.99 16.01	5.98 52.79	8.79 21.61	8.64 14.42	8.45 14.54
94	GRINDING	4.5	50	29	15000	250	69.6	8.0	8.0	C. Head	100.00	11.20	5.37	1.61	36.39	42.71	100.00	100.00	100.00	100.00	100.00
	ROUCHER	20	20		575	50	34.8	8.0	7.8	C-1	76.35	12.21	4.83	1.55	41.93	49.44	83.33	68.68	73.73	87.97	88.38
	SCAVENGER	10						8.0	8.0	C-2 Tail	8.14 15.51	12.97 5.11	4.58 8.44	1.79 1.78	35.67 9.51	40.39 10.80	9.43 7.19	6.94 24.38	9.08 17.20	7.98 4.05	7.70 3.92
95	GRINDING	4.5	50	29	15000	250	69.6	9.3	9.4	C. Head	100.00	11.67	5.32	1.57	36.96	42.53	100.00	100.00	100.00	100.00	100.00
	ROUCHER	20	20		1475	50	23.2	8.9	8.9	C-1	65.58	13.10	4.58	1.74	42.18	48.91	73.92	56.49	72.50	74.85	75.42
	SCAVENGER	10						8.9	8.9	C-2 Tail	17.41 17.01	12.60 5.00	3.86 9.65	1.07 1.45	40.17 13.52	45.33 15.04	18.79 7.28	12.64 30.87	11.84 15.67	18.93 6.22	18.56 6.01

Table 32 Flotation Test Results of Rakah Massive Ore
 - Effect of mixing ratio of Rakah massive ore on bulk flotation of composite ore -

TEST No.	OPER ACTION	CONDITIONS						PROD UCTS	WEIGHT %	ASSAY				DISTRIBUTION						
		R* %	limp. %	D. Size %	Lime g/t	KAX g/t	AP55 g/t			PH Initial	PH Final	Au g/t	Ag g/t	Cu %	Fe %	S %	Au %	Ag %	Cu %	Fe %
99	GRINDING		9	60				C. Head	100.00											
	ROUGHER	0	15	35	2200	35	37.2	11.4	11.4	17.03	1.25	3.95	35.29	100.00	99.96	100.00	61.35			
	SCAV'ER1		5		200	5	9.3	11.4	10.6	1.67	0.78	21.40	1.23	1.23	2.32	3.35				
	SCAV'ER2		10		400	5	18.6	11.1	11.1	0.61	0.61	15.64	3.14	3.14	32.98	8.61				
100	GRINDING		9	60				C. Head	100.00											
	ROUGHER	5	15	35	2900	45	37.2	11.4	11.4	17.66	1.20	3.80	35.79	100.00	100.00	100.00	57.54			
	SCAV'ER1		5		200	5	9.3	11.3	10.5	2.65	4.41	32.04	10.03	10.03	14.20	6.95				
	SCAV'ER2		10		200	5	18.6	11.1	11.1	1.65	6.30	22.03	6.76	6.76	12.94	4.93				
101	GRINDING		9	60				C. Head	100.00											
	ROUGHER	10	15	35	3820	50	37.2	11.4	11.4	18.34	1.22	3.41	35.82	100.00	100.00	100.00	61.76			
	SCAV'ER1		5		200	5	9.3	11.4	10.6	3.51	5.67	23.15	4.58	4.58	5.70	2.75				
	SCAV'ER2		10		200	5	18.6	11.0	11.0	3.65	7.77	24.40	9.91	9.91	14.92	5.35				
102	GRINDING		9	60				C. Head	100.00											
	ROUGHER	20	15	35	5240	80	27.9	11.4	11.4	18.36	2.44	2.89	37.80	100.00	100.00	100.00	61.76			
	SCAV'ER1		5		200	5	9.3	11.4	10.8	3.72	6.93	19.02	3.07	3.07	4.49	2.75				
	SCAV'ER2		10		200	5	18.6	11.0	11.0	3.44	8.48	18.90	3.71	3.71	6.77	5.35				
103	GRINDING		9	60				C. Head	100.00											
	ROUGHER	30	15	35	6800	110	27.9	11.4	11.4	22.85	1.34	2.60	39.30	100.00	100.00	100.00	61.76			
	SCAV'ER1		5		200	5	9.3	11.2	10.8	6.23	3.51	15.92	2.85	2.85	8.13	1.49				
	SCAV'ER2		10		200	5	18.6	10.8	10.8	4.94	12.61	20.02	3.08	3.08	8.26	1.79				
104	GRINDING		9	60				C. Head	100.00											
	ROUGHER	40	15	35	7600	110	27.9	11.4	11.4	24.65	1.38	2.42	40.77	100.00	100.00	100.00	61.76			
	SCAV'ER1		5		200	5	9.3	11.2	10.8	8.95	3.10	14.53	3.15	3.15	4.15	1.84				
	SCAV'ER2		10		200	5	18.6	10.8	10.8	6.87	6.41	23.78	3.13	3.13	4.03	2.23				

the composite ore was prepared by mixing Hayl as Safil ore with Rakah stockwork ore in the ratio 1.85 to 1.
 R* : Percent of Rakah massive ore

Table 33 Flotation Test Results of Composite Ore
- Bulk and copper selective rougher/cleaner flotation -

TEST No.	OPER ATION	CONDITIONS				PROD UCITS	WEIGHT %	ASSAY							DISTRIBUTION									
		Time min	P.D. %	Size %	Temp °C			Lime g/l	KAX g/l	AF65 g/l	pH Initial	pH Final	Au g/t	Ag g/t	Cu %	Zn %	Fe %	S %	Au %	Ag %	Cu %	Zn %	Fe %	S %
105	GRINDING	9	60	48	32	2800	50	93	11.4	10.5	C-Head	100.00	0.48	3.16	1.17	0.24	16.81	13.12	100	100	100	100	100	100
	ROUGHER	30	35			1000					R-C	40.48	1.12	7.38	2.83	0.53	29.84	31.60	93.82	94.54	97.46	87.80	71.36	97.46
	REGRIND	7.5									R-T	59.52	0.05	0.29	0.05	0.05	6.09	0.56	6.18	5.46	2.54	12.20	28.64	2.54
	CLEANING OF ROUGHER										IC-C	7.43	3.56	21.08	13.39	2.32	32.67	38.71	54.92	49.58	84.80	70.78	14.44	21.91
	1-CL'ER	15	21	95	28	1700					IC-M	93.05	0.57	4.30	0.45	0.13	28.96	30.00	38.90	44.96	12.66	17.04	56.92	75.55
	1CL-SCA	10	18				6	27.9	12.8	12.6	ICSS-C	2.02	1.14	6.26	2.59	0.52	36.78	41.05	4.79	4.01	4.47	4.32	4.43	6.33
	2-CL'ER	13	14			400		4.7	12.8	12.8	ICSS-T	31.02	0.53	4.17	0.31	0.10	28.45	29.28	34.12	40.95	8.20	12.72	52.50	69.22
	3-CL'ER	13	13			400			12.8	12.8	2CC-C	6.07	4.08	23.66	5.83	2.73	32.40	39.44	51.08	45.38	81.88	67.85	11.59	18.24
	4-CL'ER	12	12			400			12.8	12.8	2C-C	1.36	1.35	9.51	2.51	0.52	33.85	35.42	3.84	4.10	2.91	2.91	2.74	3.68
	5-CL'ER	12	11			400			12.8	12.8	3C-C	5.31	4.37	24.81	17.41	3.00	31.87	39.40	48.09	41.68	78.73	65.26	10.06	15.93
6-CL'ER	11	10			500			12.8	12.8	3C-M	0.76	1.89	15.77	4.87	0.83	36.05	39.78	2.98	3.80	3.16	2.59	1.63	2.31	
BULK	GRINDING										4C-C	4.83	4.69	25.74	18.45	3.20	31.48	39.21	47.06	39.39	76.03	63.46	9.03	14.45
	ROUGHER									4C-M	0.47	1.06	15.31	16.71	0.93	35.93	41.29	1.04	2.39	2.70	1.80	1.01	1.48	
	REGRIND									5C-C	4.49	4.91	15.86	9.18	3.35	31.26	39.08	45.76	36.77	73.40	61.72	8.35	13.38	
	CLEANING OF ROUGHER									5C-M	0.34	1.82	24.12	8.96	1.24	34.95	40.77	1.30	2.63	2.83	1.73	0.70	1.07	
	1-CL'ER	15	20	95	26	1000					6C-C	4.11	5.20	25.94	18.95	3.52	31.05	38.97	44.30	33.2	69.82	59.27	7.59	12.19
	2-CL'ER	13	13			400					TTL-C	0.38	1.82	25.05	10.93	1.55	33.37	40.40	1.45	3.05	3.58	2.45	0.75	1.18
	3-CL'ER	13	13			400					TTL-M	4.11	5.20	25.94	18.95	3.52	31.05	38.97	44.30	33.72	69.82	59.27	7.59	12.19
	4-CL'ER	12	12			400					TTL-T	5.35	1.39	11.74	4.27	0.72	35.46	39.39	15.40	19.87	19.45	15.80	11.28	16.05
	5-CL'ER	11	10			500					C-Head	100.00	0.53	2.77	1.26	0.28	17.33	13.01	100	100	100	100	100	100
	6-CL'ER	10	10			500					R-C	19.25	1.85	9.99	5.80	1.01	35.20	38.15	67.92	59.85	89.07	70.71	39.16	56.52
106	GRINDING	16	60	80	31	3120	45	65.1	11.6	11.3	C-Head	100.00	0.53	2.77	1.26	0.28	17.33	13.01	100	100	100	100	100	100
	ROUGHER	30	35			1000				R-C	80.72	0.21	1.04	0.17	0.10	13.06	7.01	32.18	30.35	10.93	29.29	60.84	43.48	
	REGRIND	4								IC-C	6.39	3.12	14.62	14.09	2.56	34.31	39.92	37.32	33.75	71.67	59.82	12.64	18.59	
	CLEANING OF ROUGHER									IC-M	12.89	1.23	7.70	1.69	0.23	35.64	37.28	30.00	35.90	17.40	10.89	26.52	36.93	
	1-CL'ER	15	20	95	26	500		9.3	12.8	12.8	ICSS-C	1.40	2.50	11.97	8.26	0.83	34.23	37.83	6.86	6.07	8.25	4.27	2.77	4.18
	2-CL'ER	13	14			400	1	9.3	12.8	12.8	ICSS-T	11.49	1.07	7.18	0.89	0.15	35.81	37.08	23.84	29.83	8.14	6.67	23.74	32.75
	3-CL'ER	13	11			400			12.8	12.8	2C-C	4.85	3.70	17.37	17.84	3.27	32.50	38.86	34.10	30.49	68.99	57.54	9.10	14.49
	4-CL'ER	12	11			500			12.8	12.8	2C-M	1.53	1.28	5.88	2.20	0.41	40.07	43.27	3.72	3.26	2.68	2.28	3.54	5.09
	5-CL'ER	11	8			500			12.8	12.8	3C-C	4.13	4.07	18.86	20.24	3.72	31.23	37.94	31.88	28.14	66.55	55.65	7.44	12.03
	6-CL'ER	10	7			500			12.8	12.8	4C-C	0.73	1.61	8.93	4.21	0.72	39.71	44.06	2.22	2.35	2.44	1.90	1.66	2.46
STRAIGHT	GRINDING										4C-M	3.60	4.37	19.93	21.90	4.08	30.52	37.37	29.66	25.93	62.76	53.27	6.34	10.33
	ROUGHER									4C-T	0.53	2.01	11.59	9.01	1.24	36.05	41.84	2.02	2.22	3.80	2.38	1.70	1.70	
	REGRIND									5C-C	3.15	4.59	19.16	22.98	4.40	30.17	36.96	27.44	21.80	57.59	50.22	5.47	8.94	
	CLEANING OF ROUGHER									5C-M	0.45	2.82	25.25	14.38	1.86	33.07	40.20	2.42	4.49	5.77	3.05	0.87	1.40	
	1-CL'ER	15	20	95	26	500					6C-C	2.77	4.77	18.51	23.68	4.56	29.96	36.88	25.08	18.54	52.24	46.83	4.79	7.85
	2-CL'ER	13	13			400					TTL-C	2.77	4.77	18.51	23.68	4.56	29.96	36.88	25.08	18.54	52.24	46.83	4.79	7.85
	3-CL'ER	13	13			400					TTL-M	5.02	2.04	11.73	1.18	0.95	36.69	41.28	19.39	21.28	28.69	17.22	10.63	15.92
	4-CL'ER	12	11			500					TTL-T	92.21	0.32	1.81	0.26	0.11	15.89	10.76	55.52	60.78	19.07	35.95	84.58	76.23
	5-CL'ER	11	10			500																		
	6-CL'ER	10	10			500																		

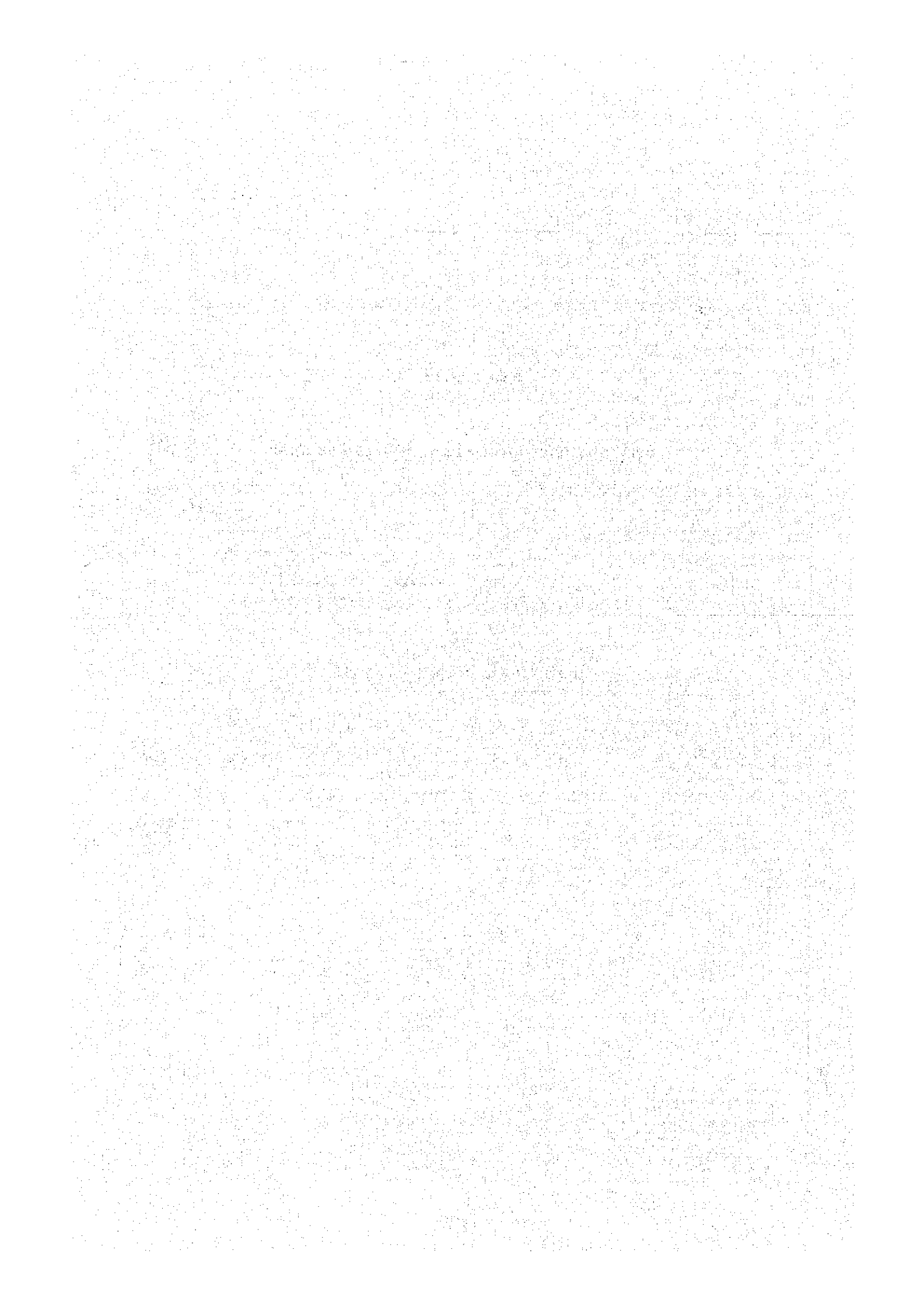
Table 34 - Flotation Test Results of Composite Ore
- Scalp rougher/cleaner flotation -

TEST No.	OPER ACTION	CONDITIONS				PROD UClS	WEIGHT %	ASSAY							DISTRIBUTION						
		Time	D. Size	Temp	Lime			AP3501	NF35	PH	Au	Ag	Cu	Zn	Fe	S	Au	Ag	Cu	Zn	Fe
		min	%	°C	g/t	g/t		Initial	Final	g/t	g/t	%	%	%	%	%	%	%	%	%	%
107	GRINDING	15	60		2000	AP3501		11.6	11.2	0.49	2.57	1.15	0.24	16.75	13.34	100	100	100	100	100	100
	ROUGHER	5	35	31	1100	46.7 KAX	23.3			1.81	9.72	6.47	1.16	30.52	34.08	62.37	83.43	94.22	82.41	30.56	42.86
	ROUGHER-SCALER	25			600	10	46.5	11.6	10.9	2.94	16.98	19.78	3.83	29.23	38.02	27.51	19.42	50.50	47.61	5.13	8.38
	CLEANING	OF								4.63	2.42	8.31	1.20	32.79	38.68	23.15	22.56	33.42	25.38	8.06	13.43
	1-CL'ER	9			FROTH			12.8	12.9	0.96	6.97	3.78	0.52	33.62	37.55	3.17	2.60	3.14	2.10	1.92	2.72
	2-CL'ER	8						12.8	12.9	8.25	0.74	5.88	1.00	21.29	29.66	12.54	18.86	7.16	7.32	14.45	18.33
	3-CL'ER	6						12.8	12.8	2.81	14.13	10.14	1.56	32.78	39.75	19.89	18.95	30.36	22.77	6.75	10.27
	4-CL'ER	5						12.8	12.8	1.18	1.34	7.84	2.98	32.78	35.57	3.26	3.08	2.60	2.60	2.32	3.16
	5-CL'ER	5						12.8	12.8	2.80	3.05	15.48	1.33	32.62	35.94	17.58	16.86	27.55	20.50	5.45	8.38
	REGROUND	3.5			1000			12.8	12.8	2.22	3.25	16.69	12.58	1.91	32.39	39.85	14.82	14.39	24.10	17.93	4.28
CLEANING	OF			FROTH			12.8	12.8	0.58	2.28	10.89	6.81	1.04	33.50	40.25	2.74	2.48	3.46	2.57	1.17	1.76
1-CL'ER	15						12.8	12.8	1.68	12.85	7.76	1.55	31.86	40.84	12.81	11.47	20.17	14.11	3.11	4.84	
1CL-SCA	10						12.8	12.8	4.30	18.29	15.98	2.07	31.42	39.06	10.72	8.63	16.83	10.62	2.28	3.55	
3-CL'ER	13						12.8	12.8	0.58	0.42	17.42	9.16	1.97	33.13	41.06	2.09	2.84	3.34	3.50	0.33	1.29
5-CL'ER	9						12.8	12.8	4.15	4.01	17.96	3.32	29.87	38.32	34.23	28.05	67.33	58.23	7.41	11.93	
6-CL'ER	3						12.8	12.8	4.38	1.73	9.71	5.19	33.34	38.39	15.60	16.52	19.73	16.87	8.71	12.60	
GRINDING	16			2000	AP3501		11.7	11.4	0.56	2.57	1.17	0.23	17.03	13.30	100	100	100	100	100	100	100
ROUGHER	2	35	80	29	960	46.7 KAX	18.6			2.22	10.45	7.40	1.28	31.93	34.81	57.63	59.54	92.71	81.53	27.50	38.38
ROUGHER-SCALER	28				500	10	46.5	11.4	11.1	0.28	1.22	0.10	0.05	14.47	9.50	42.37	40.46	7.29	18.47	72.50	61.62
CLEANING	OF			FROTH						3.95	15.99	2.52	4.35	29.64	35.99	7.55	6.64	20.83	20.25	8.82	2.91
1-CL'ER	2						12.9	12.8	7.38	1.14	7.03	1.27	0.24	31.28	31.68	35.12	32.76	63.85	53.52	12.07	17.89
2-CL'ER	2						12.9	12.9	0.78	2.28	9.36	4.00	0.52	35.20	38.51	14.97	20.14	8.02	7.75	13.55	7.57
3-CL'ER	1.5						12.8	12.8	6.59	1.01	6.15	0.95	0.21	30.82	30.87	3.16	2.84	2.67	1.76	1.61	2.26
REGROUND	3.5			1000			12.9	12.8	1.02	3.43	4.45	1.37	2.28	32.77	38.73	11.71	29.13	61.04	51.22	9.98	15.11
CLEANING	OF			FROTH						1.88	9.44	0.52	4.83	36.23	34.41	3.41	3.63	2.81	2.30	2.09	2.79
1-CL'ER	15						12.7	12.7	4.65	3.61	15.10	14.89	2.49	32.46	38.74	29.73	27.26	59.14	50.01	8.86	13.54
1CL-SCA	10						12.7	12.8	0.54	2.04	8.93	4.14	0.52	35.44	38.64	1.98	1.87	1.90	1.21	1.12	1.56
3-CL'ER	14						12.9	12.8	4.20	3.76	15.61	15.74	2.65	32.18	38.63	28.02	25.49	56.49	48.21	7.94	12.20
4-CL'ER	11						12.9	12.8	0.45	2.15	10.23	6.94	0.93	35.08	38.79	1.70	1.78	2.65	1.80	0.92	1.34
5-CL'ER	9						12.8	12.8	3.73	3.93	16.20	16.73	2.83	32.12	36.73	26.02	23.51	53.41	45.71	7.04	10.88
6-CL'ER	1						12.8	12.8	0.47	2.42	10.89	7.13	1.24	32.64	37.87	10.76	1.97	3.08	2.50	0.89	1.33
6CL-SV1	2						12.8	12.9	1.20	3.33	15.55	12.84	1.99	32.86	39.26	7.12	7.02	13.21	10.37	2.32	3.55
6CL-SV2	6						12.8	12.9	0.89	3.47	14.15	13.77	2.07	33.37	39.78	5.40	4.90	10.48	7.98	1.74	2.66
					NaHSO3ZnSO4		12.9	12.9	0.31	3.09	17.42	10.18	1.76	31.42	37.73	1.72	2.12	2.72	2.39	0.58	0.89
							12.9	12.9	4.50	4.00	16.04	18.61	3.27	31.63	38.14	91.85	26.03	71.51	63.57	8.35	12.90
							12.9	12.9	3.57	2.21	10.25	5.19	0.77	34.45	37.89	18.97	14.21	15.84	11.96	7.22	10.17
							12.9	12.9	91.94	0.93	1.62	0.06	0.06	15.64	11.13	54.18	57.76	12.65	24.47	84.44	76.93

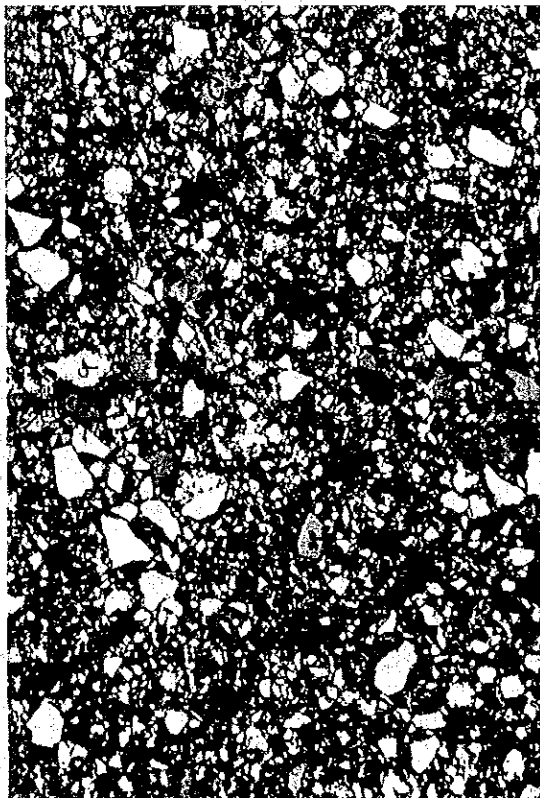
* ILL-C of Test No.108 = Conc.1 + Conc.2 + 6CSI-C + 6CS2-C

Appendix 7

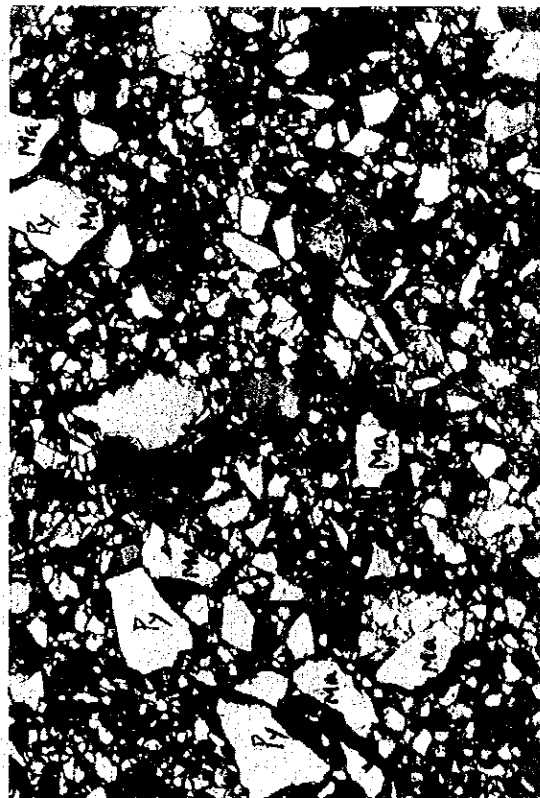
SEM and microprobe images of test samples



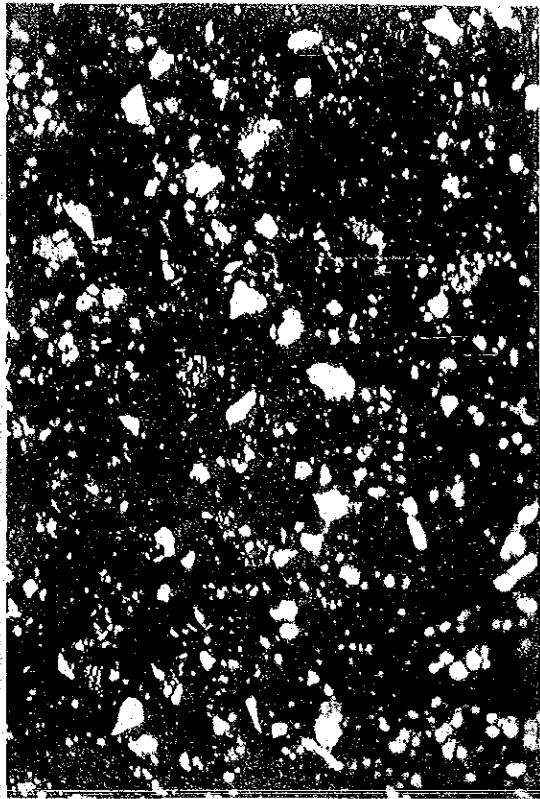
Photomicrograph 1 Flotation products of Rakah massive ore



10 min. Product (magnification: X 175, 100 μm)



10 min. Product (magnification: X 350, 50 μm)

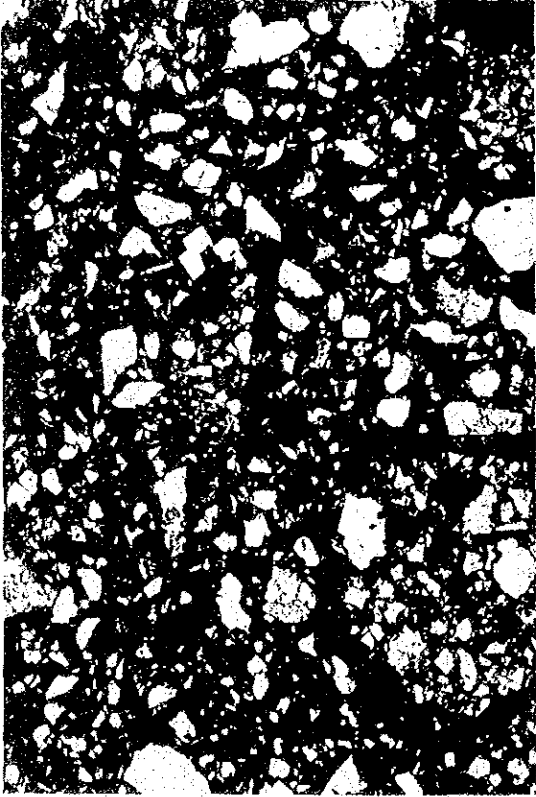


30 min. Product (magnification: X 175, 100 μm)

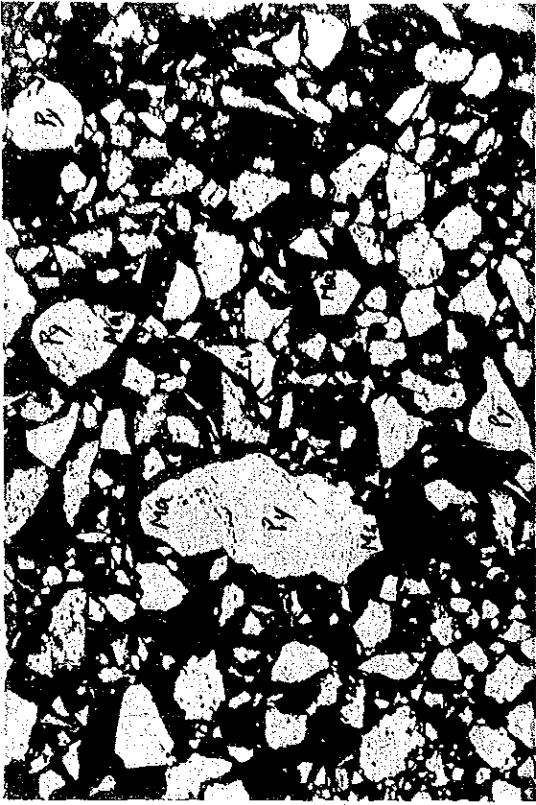


30 min. Product (magnification: X 350, 50 μm)

Photomicrograph 2 Flotation products of Rakah massive ore



50 min. Product (magnification: $\times 175$, $100 \mu\text{m}$)



80 min. Product (magnification: $\times 175$, $100 \mu\text{m}$)

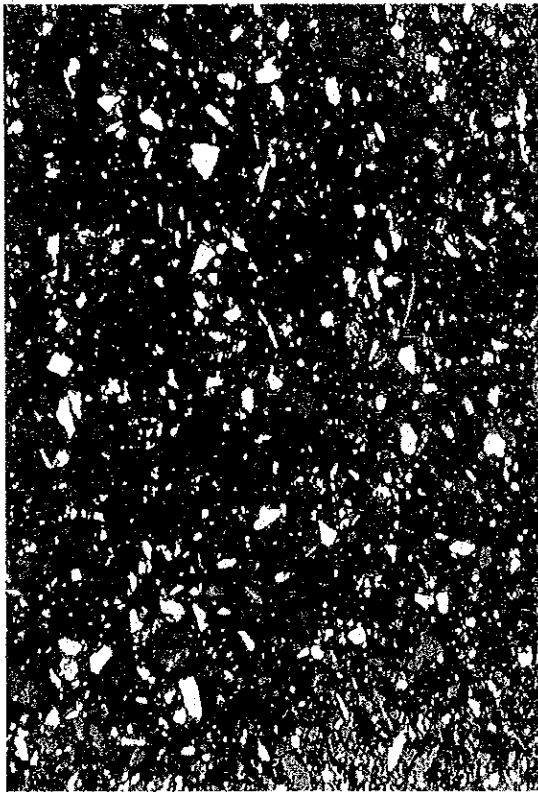


50 min. Product (magnification: $\times 350$, $50 \mu\text{m}$)



80 min. Product (magnification: $\times 350$, $50 \mu\text{m}$)

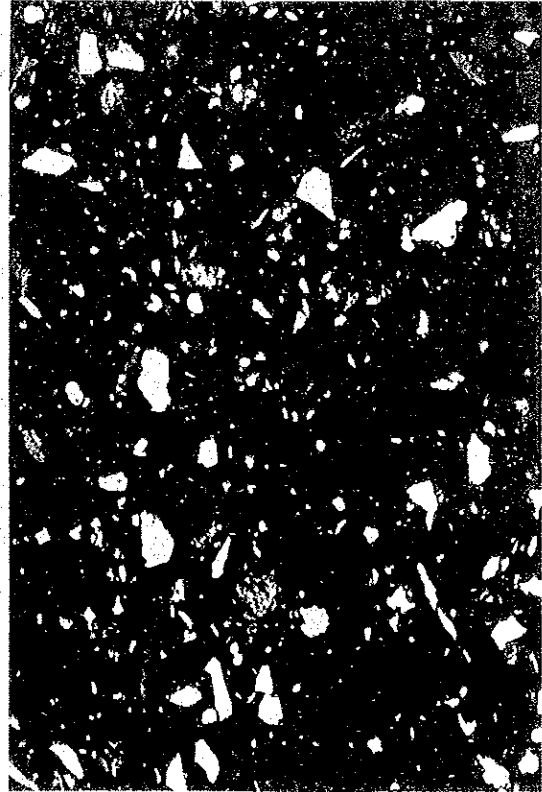
Photomicrograph 3 Flotation products of Rakah massive ore



tailing (magnification: X 175, 100 μ m)

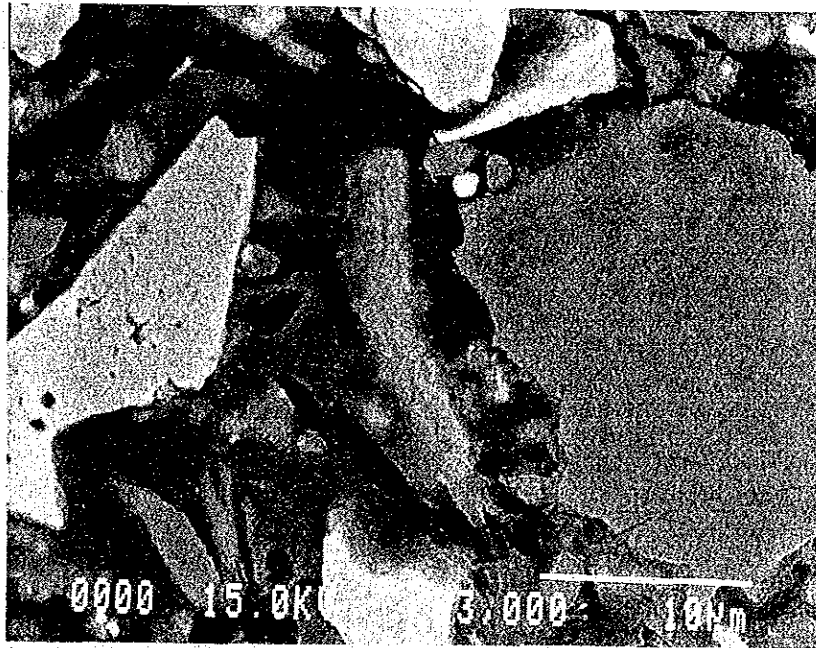


tailing (magnification: X 175, 100 μ m)



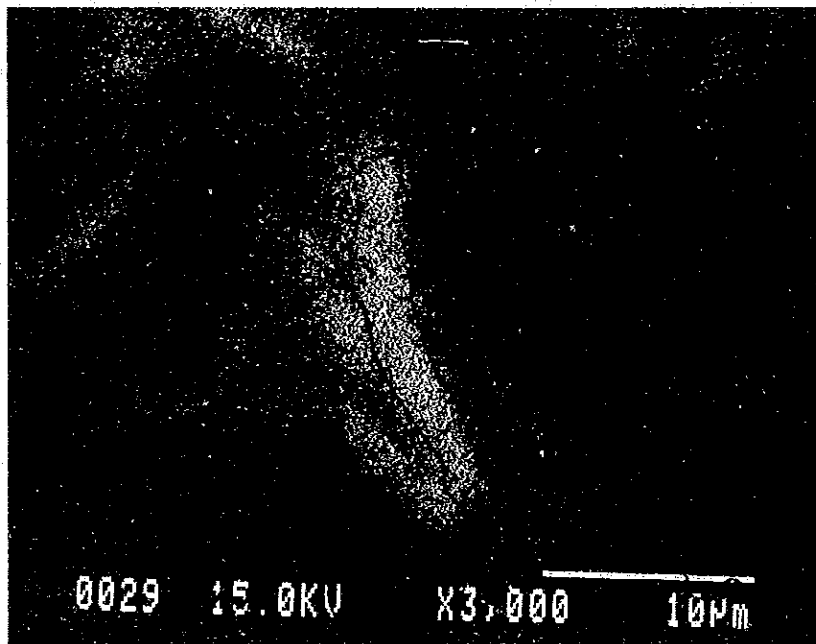
tailing (magnification: X 350, 50 μ m)

X-ray image of tailing by EPMA analysis



Back scattered electron image

X-ray images of tailing by EPMA analysis



Cu K α X-ray Image



Si K α X-ray Image

