CYPRUS ANVIL MINING CORPORATION INTEROFFICE CORRESPONDENCE

Jaakko

006976

To S. Chmelyk

From S. Frei

Date October 18, 1982

Subject 2A POST FLOTATION

B-X-405

PURPOSE:

To improve lead grades following cleaning of 2A ore rod mill feed (RMF) with as little loss in recovery as possible. The effectiveness of Dextrin as a graphite depressant during the post flotation process will be studied. The depressant tested was the Stadex 120 corn dextrin.

CONCLUSIONS:

1. At low concentrations of Dextrin (40 g/tonne or less) added to the third cleaner concentrate (3C.C.), high pH (10.2) is necessary in order to improve grade with less recovery loss. (Compare graph numbers 1, 2, 3, 4 and 5.)

2. A cycle test at high Dextrin concentration (720 g/tonne) with Dextrin additions throughout the three-stage post flotation process resulted in a 25% improvement in grade with a 56% recovery of the lead from 3C.C. (see graph number 7).

3. Addition of 70 g/tonne Dextrin prior to a three-stage batch post flotation process resulted in a 5% improvement in grade with a 95% recovery of the lead from 3C.C. (see graph number 8).

4. Addition of 100 g/tonne Dextrin prior to a three-stage batch post flotation process resulted in a 10% improvement in grade with a 92% recovery of the lead from 3C.C. (see graph number 9).

5. Addition of 200 to 300 g/tonne Dextrin prior to a three-stage batch post flotation process resulted in 11% improvement in grades with 90% recovery of the lead from 3C.C. (see graph numbers 10 and 11).

...2

Arctic Star Printing Inc

RECOMMENDATIONS:

1. Dextrin be used during a three-stage batch post flotation process. Optimum addition is 100 g/tonne Dextrin with 20 g/tonne Z-11 prior to post flotation.

2. Further work could be carried out on the effectiveness of adding Dextrin throughout the post flotation stages to futher improve grades of lead with less recovery loss than seen in graph number 7.

3. Further work could be carried out on the affect of pH at high (100 g/tonne or more) Dextrin concentrations.

DISCUSSION:

Dextrin is used to depress both lead and graphite following the lead cleaning stages. When using Z-11 as a collector, the graphite is held in by the colloidal matrix of Dextrin, allowing for selective flotation of the lead, leaving the graphite in the tails.

Some batch tests were performed using lead 3C.C. taken from the mill on June 2, 1982 (see graph numbers 1, 2 and 3). Others were performed using lead 3C.C. prepared by Ron Martel in August 1982 (see graph numbers 8, 9, 10 and 11).

Cycle tests were also performed (see graph numbers 4, 5 and 7) on lead 3C.C. prepared in the lab.

Flow diagrams and specific test conditions for the above-mentioned post flotation tests are reported in the procedure.

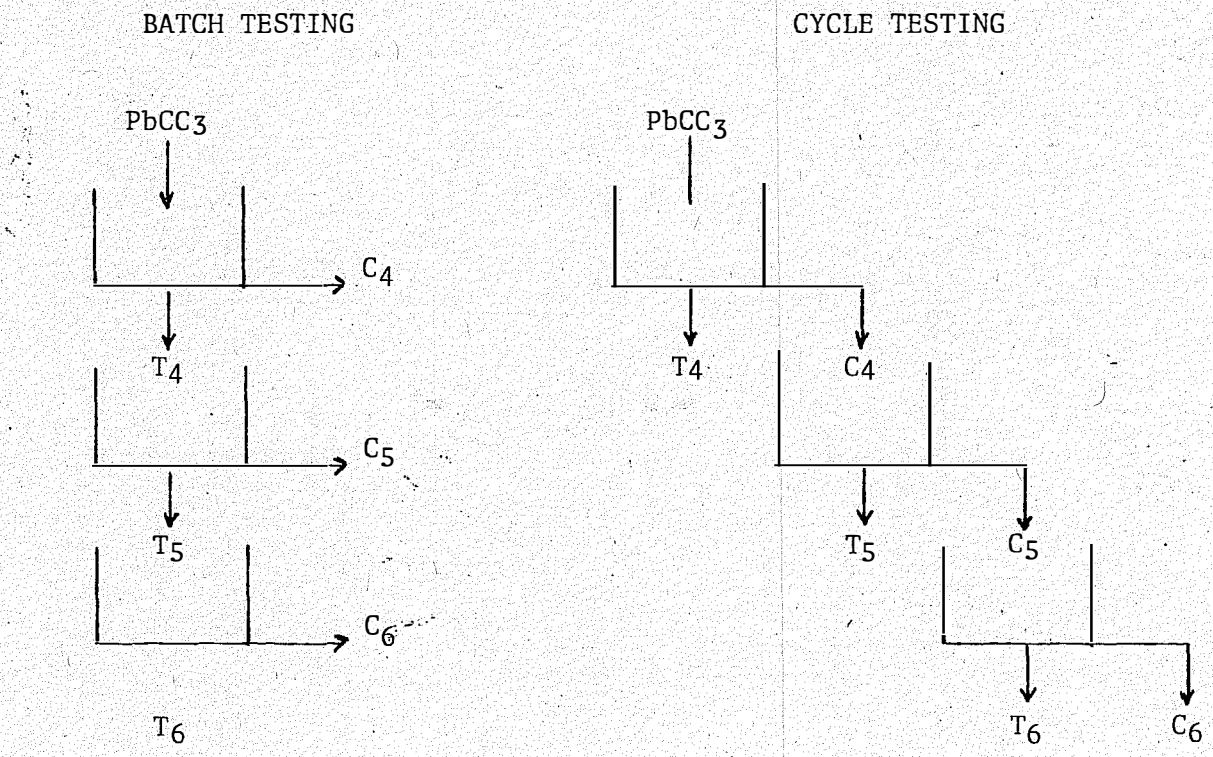
MIBC frother addition was not necessary for the first five tests (1 to 5 inclusive) as a good stable froth formed in the absence of frother. When higher concentrations of Dextrin (70 g/tonne or more) were used, MIBC had to be added prior to each of the three post flotation stages to ensure good froth conditions.

All tests were performed on 1,000 g $PbCC_3$ as heads.

...3

PROCEDURE:

Flow Diagram for Post Flotation Using Dextrin*



* All tests done using 100.0 g 3C.C. of lead circuit.

Procedure (Cont'd)

Specific Test Conditions for Post Flotation Using Dextrin

GRAPH NO.	TEST NUMBER	TYPE OF TEST	pH	REAGENT ADDITION (g/TONNE)						
				BEFORE C_4		BEFORE C_5		BEFORE C_6		Frother
				Dextrin	Z-11	Dextrin	Z-11	Dextrin	Z-11	Used?
1*	27751 27753	Batch	9.4	10	25	0	25	0	25	no
2*	27752 27754	Batch	9.4	25	25	0	25	0	25	no
3*	27763	Batch	10.2	25	25	0	25	0	25	no
4	27755 27756	Cycle	9.5	40	12	-	-	-	-	no
5	27757 27758	Cycle	8.5	30	20	15	10	-	-	no
7	27764	Cycle	9.5	120	55	300	20	300	60	yes++
8	27759	Batch	9.5	70	20	0	0	0	0	yes
9	27760	Batch	9.5	100	20	0	0	0	0	yes
10	27761	Batch	9.5	200	20	0	5	0	0	yes
11	27762	Batch	9.5	300	20	0	5	0	0	yes

* These tests were done using 3C.C. from the mill (high graphite, low sulphide 3C.C. of June 2, 1982).

...5

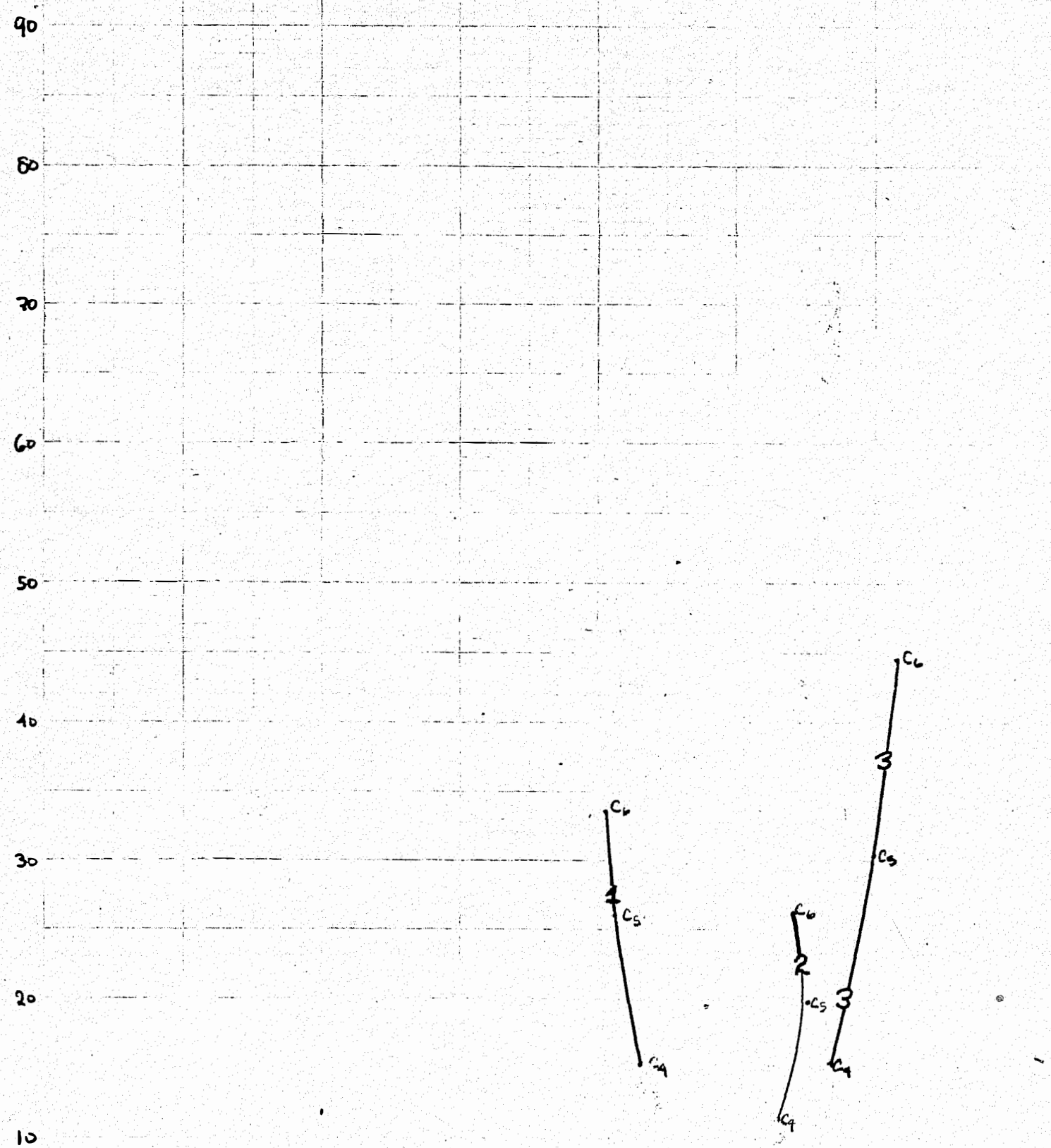
OBSERVATIONS:

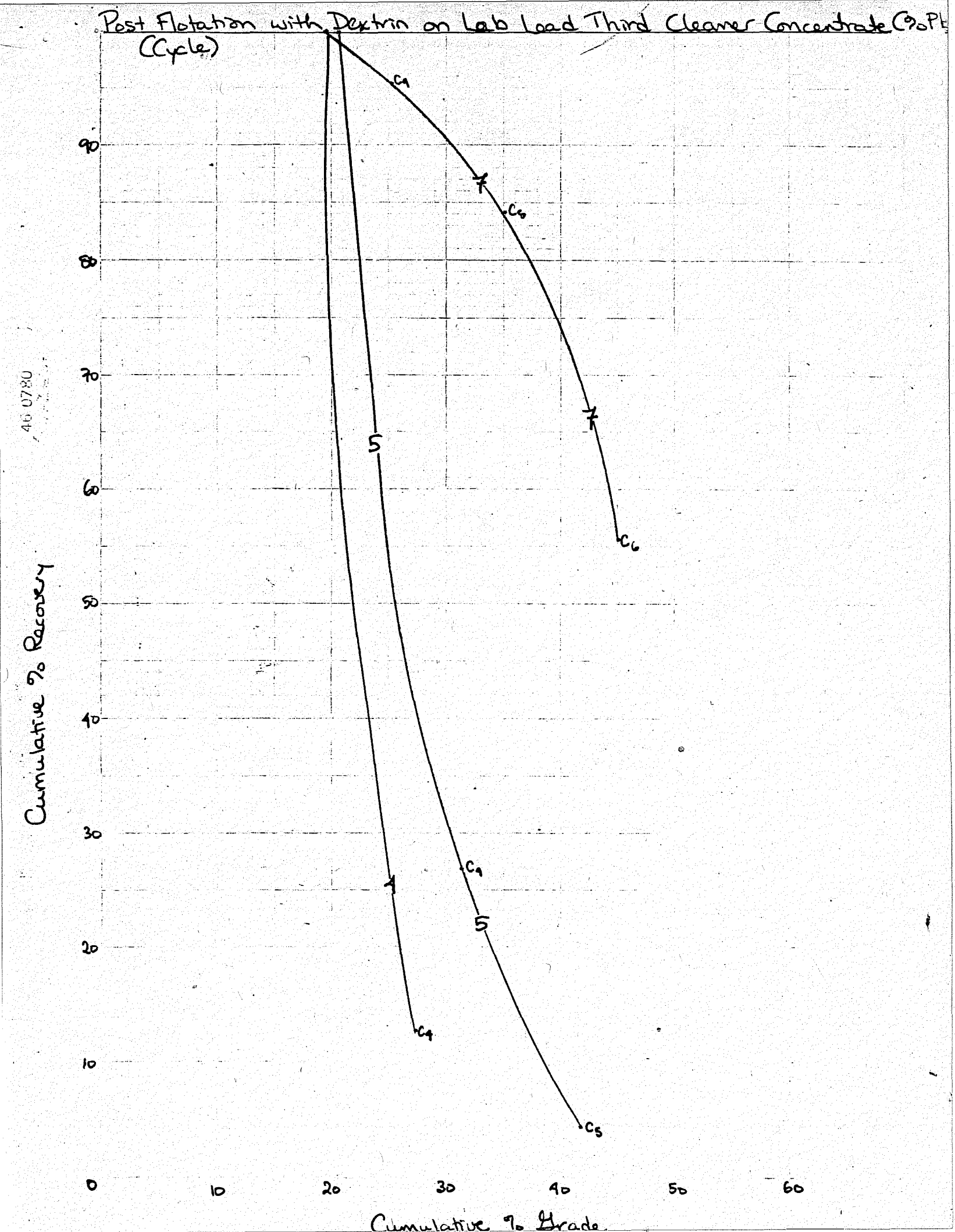
Summary of Achieved Cumulative Lead Grades and Recoveries Throughout Each Test

GRAPH NUMBER	HEADS ASSAY	C_4		C_5		C_6	
		% GRADE	% RECOVERY	% GRADE	% RECOVERY	% GRADE	% RECOVERY
1	14.81	14.30	15.40	14.13	25.92	14.08	33.64
2	14.77	15.31	11.36	15.52	19.81	15.42	26.03
3	15.07	15.70	15.60	15.98	30.25	1	44.62
4	20.93	27.57	12.63	-	-	-	-
5	20.82	31.23	26.88	41.75	4.33	-	-
7	19.62	25.15	95.29	35.07	84.17	45.10	55.59
8	20.84	37.30	73.85	30.04	88.56	26.21	95.08
9	20.91	48.40	59.72	38.12	80.34	30.56	91.83
10	20.73	48.00	39.83	40.07	74.67	32.15	89.86
11	20.99	48.20	36.85	39.66	75.24	32.02	90.28

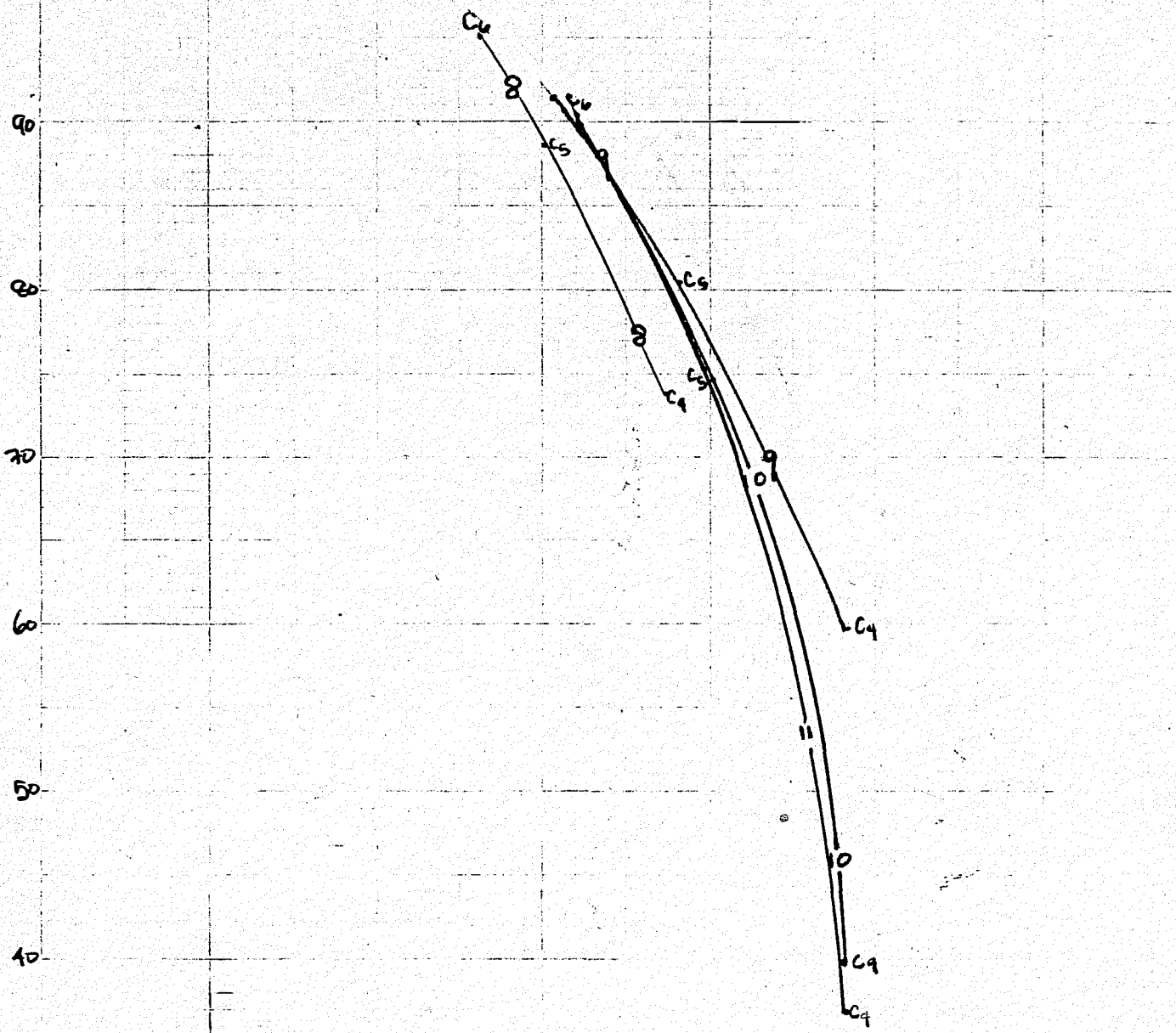
Post Flotation with Dextrin on Mill Lead Third Cleaner Concentrate (%Pb)

(Batch)




Post Flotation with Dextrin on Lab Lead Third Cleaner Concentrate (% Pb
(Cycle)
C4
C5
C6
C7
C8
C9
7
7
7
5
5
1
90
80
70
60
50
40
30
20
10
0
10
20
30
40
50
60
Cumulative % Recovery
Cumulative % Grade
46 0780

Post Flotation with Dextrin on Lab Lead Third Cleaner Concentrate (% Pb)
(Batch)



Cumulative % Recovery

90
80
70
60
50
40
30
20
10

0 10 20 30 40 50 60

Cumulative % Grade