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To B.R. Davia c.c. J. Levanaho, G.D. Biles, R. Murar  
From S. Frei W.N. Wallinger, S. Chmelyk, G.W. Chapm  
Date June 4, 1982 W. Kleinschrot, Met. Techs.  
Subject PRELIMINARY RECLEANING AND REVERSE FLOTATION TESTING

PURPOSE:

To determine whether lead can be selectively recleaned from lead concentrate (with Sodium Isopropyl Xanthate/Z-11) by the addition of Depramin or Dextrin before recleaning and to determine whether carbon can be selectively recovered by reverse flotation from lead concentrate (with Z-11) by addition of Pottasium Dichromate or by lowering pH and raising the slurry temperature before flotation.

CONCLUSIONS:

1. Depramin as a carbon/lead depressant for lead concentrate recleaning  
Depramin effectively depressed carbon with recovery losses of 40-45% (ore comparisons are with standard) but although lead grade improved (+11%) there was considerable recovery loss (-27%) of lead into the tailings.
2. Dextrin as a carbon/lead depressant for lead concentrate recleaning  
When no frother was used on recleaning, Dextrin effectively depressed carbon with -28% recovery. The grade of lead improved (+10%) with some loss of lead recovery (-11%). When Dextrin was used in combination with MIBC frother, there was no significant deviation from the standard test.
3. Pottasium Dichromate as a lead/carbon depressant in reverse flotation  
Pottasium Dechromate effectively depressed lead producing a cleaner tails sample of 64% lead with only 0.30% carbon. Even zinc from the lead concentrate slurry selectively reverse floated off with the carbon.

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Conclusions (cont'd)

4. Low pH, high temperature reverse flotation.

Lowering pH with  $H_2SO_4$  to around 5.0 and raising the temperature to  $85^{\circ}C$  did not clean the carbon from the lead but rather improved lead and zinc recovery, making the tailings more barren.

RECOMMENDATIONS:

1. Depramin not be used as a carbon/lead depressant for lead concentrate recleaning.
2. Dextrin not be used as a carbon/lead depressant for lead concentrate recleaning.
3. Further testing of Pottasium Dichromate as a lead/carbon depressant in reverse flotation with studies into amounts of reagents necessary to optimize the depression and length of conditioning time required.
4. Low pH, high temperature reverse flotation not be used on lead concentrate slurry.
5. Further testing on the use of frother as a reagent in recleaning and reverse flotation.
6. Testing into length and number of cleaning stages necessary for this type of testwork.

DISCUSSION:

All of the testing described herein is preliminary testing to determine the metallurgical potential of this type of high-graphitic low sulphide ore. For this testing, three buckets of 50% total sulphide lead concentrate slurry of May 27, 1982 (4-12 shift) were collected by a flotation operator.

The heads sample assay of this lead concentrate slurry was as follows:  
%Pb = 43.40; %Zn = 4.45; %Fe = 5.12; %C = 2.08 and g/tonne Ag = 10.87.

Discussion: (cont'd)

Each test used 1.4 litre of well stirred lead concentrate slurry (enough to fill a small Denver flotation cell).

Reagent additions for this preliminary testing were made as seemed appropriate. Initial additions of depressant were done in stages in order to determine the minimum amount necessary to depress the lead and/or carbon before flotation.

The object of recleaning was to depress both lead and carbon with Depramin or Dextrin and then selectively float the lead by addition of Z-11.

The object of reverse flotation was to depress the lead and carbon from floating with heat at low pH or Pottasium Dichromate and selectively float the carbon upon addition of Z-11.

OBSERVATIONS:

Froth Conditions

The lead concentrate slurry held a good, thick, stiff, well mineralized froth throughout most recleaning and reverse flotation tests. The trend was, with or without frother, that many small bubbles formed in the first cleaner stages but by the third cleaner stages the bubbles were medium in size.

The only exception to this was in the Depramin recleaning tests where there was considerably less froth formed throughout the cleaning stages.

Preliminary Recleaning and Reverse Flotation Testing .../4

Observations: (cont'd)

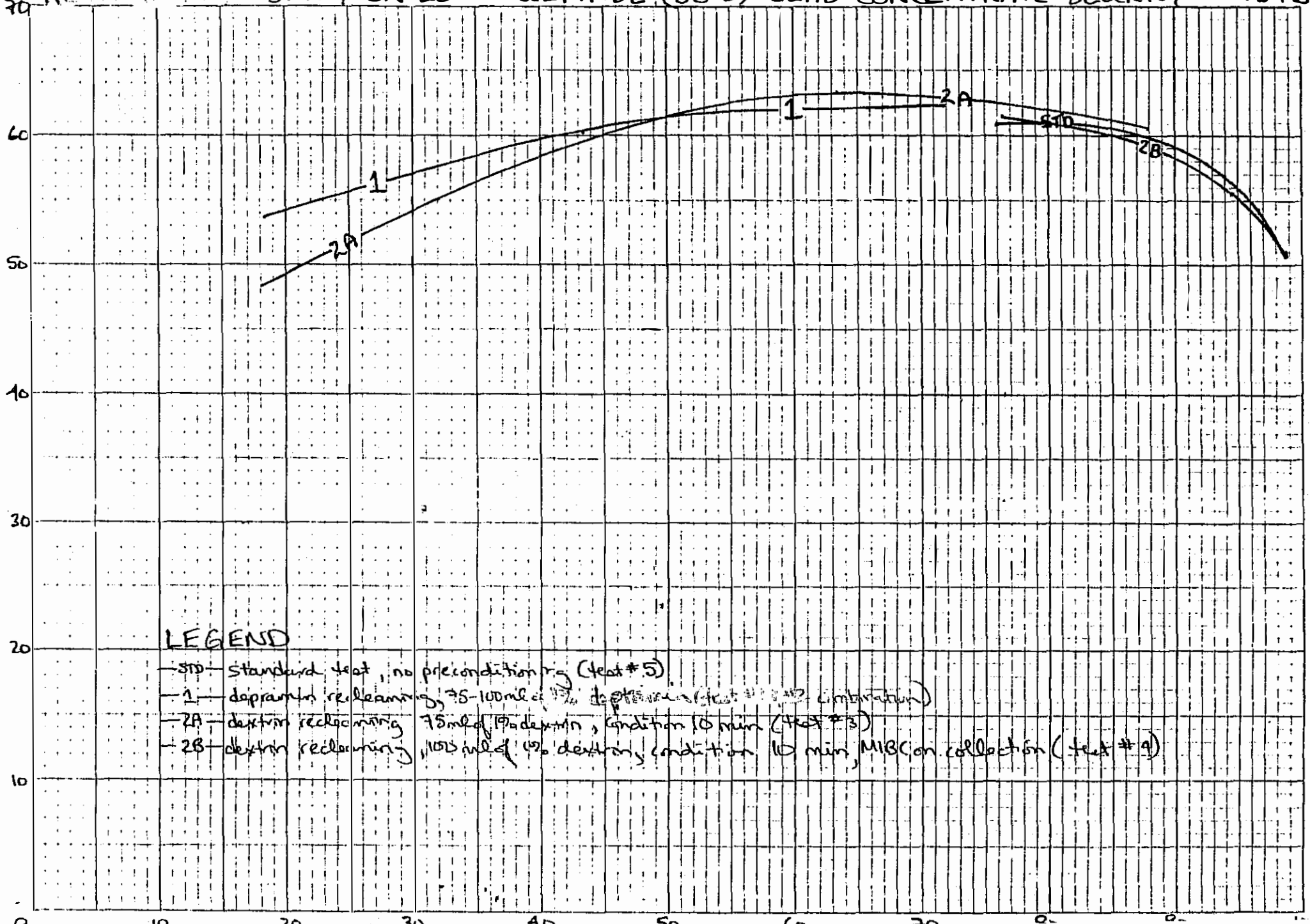
Table 3: Summary of Achieved Grades and Recoveries

	<u>HEADS ASSAY</u>		<u>TAILS ASSAYS</u>		<u>LEAD (cum.)</u>		<u>ZINC (cum.)</u>	
	<u>%Pb</u>	<u>%Zn</u>	<u>%Pb</u>	<u>%Zn</u>	<u>%Grade</u>	<u>%Recovery</u>	<u>%Grade</u>	<u>%Recovery</u>
Standard (Test#5, GraphSTD)	46.35	1.78	5.80	2.30	50.80	98.76	1.72	87.20
Depramin Recleaning (Test#1, Graph#1)	45.74	1.72	30.60	1.90	61.80	65.57	1.52	43.06
Depramin Recleaning (Test#2, Graph#1)	45.53	1.46	23.40	1.78	62.54	77.65	1.22	47.14
Dextrin Recleaning (Test#3, Graph#2A)	45.91	1.71	16.60	2.10	60.52	87.97	1.52	59.17
Dextrin Recleaning (Test#4, Graph#2B)	47.72	1.50	7.69	2.58	50.99	98.78	1.41	86.99
Pottasium Dichromate (Test#6, Graph#3)	46.42	1.63	66.50	0.24	36.47	52.53	9.80	55.15
Pottasium Dichromate (Test #8, Graph#3)	46.39	1.51	61.90	0.52	37.73	52.22	2.05	87.63
Heat at low pH (Test#7, Graph#4)	46.67	1.78	2.26	1.66	50.87	99.58	1.79	91.96
Heat at low pH (Test#9, Graph#4)	47.42	1.50	2.30	1.20	53.16	99.45	1.54	90.97

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# RECLAIMING TESTING ON LOW SULPHIDE (50%) LEAD CONCENTRATE SLURRY - % Pb

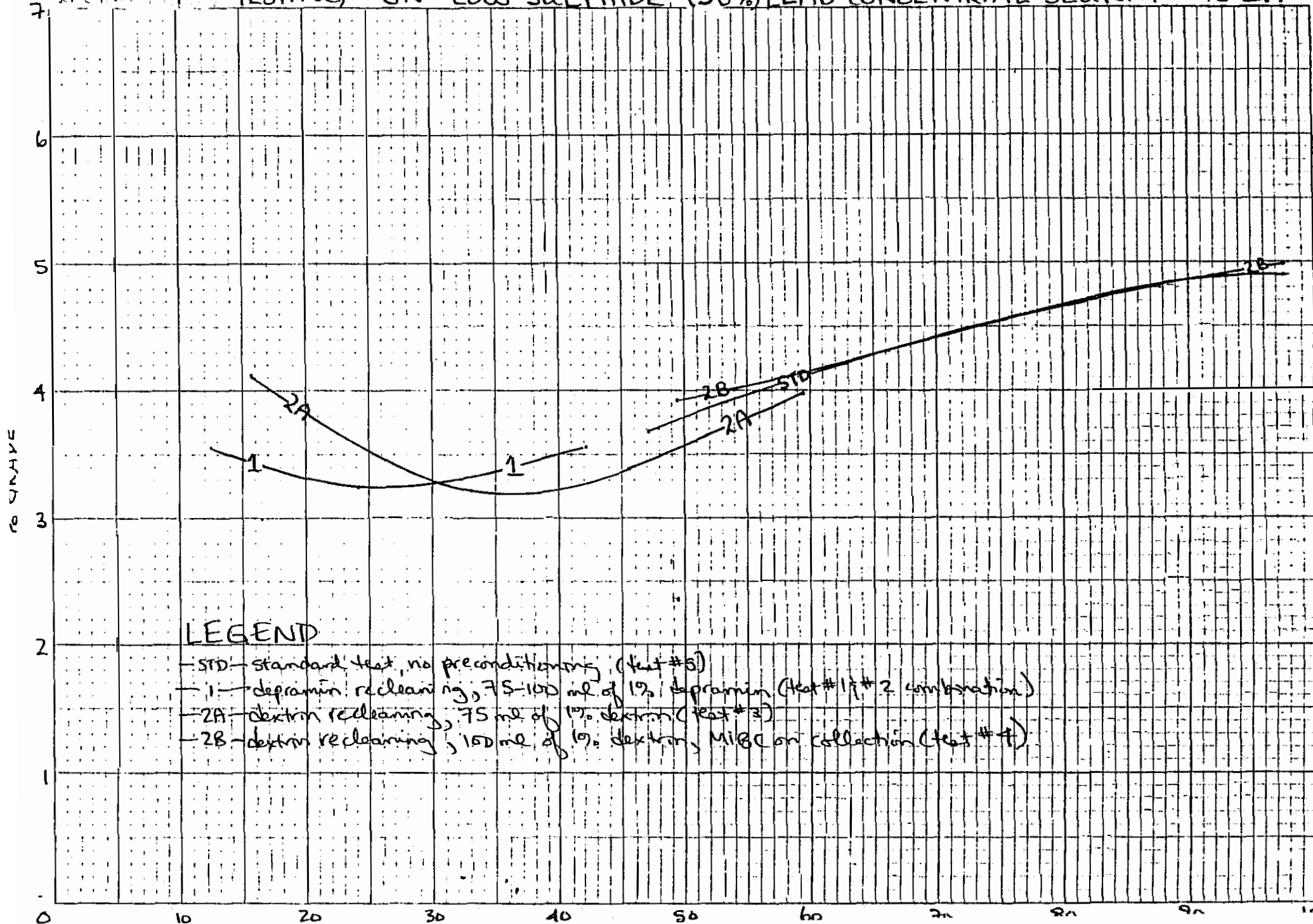


## LEGEND

- STD - Standard test, no preconditioning (test #5)
- 1 - dephramin reclamation, 75-100ml of 1% dephramin (test #1 & 2 combination)
- 2A - dextrin reclamation, 75ml of 1% dextrin, condition 10 min (test #3)
- 2B - dextrin reclamation, 100ml of 1% dextrin, condition 10 min, MIBC on collection (test #4)

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# TESTING ON LOW SULPHIDE (50%) LEAD CONCENTRATE SLURRY - % Zn



## LEGEND

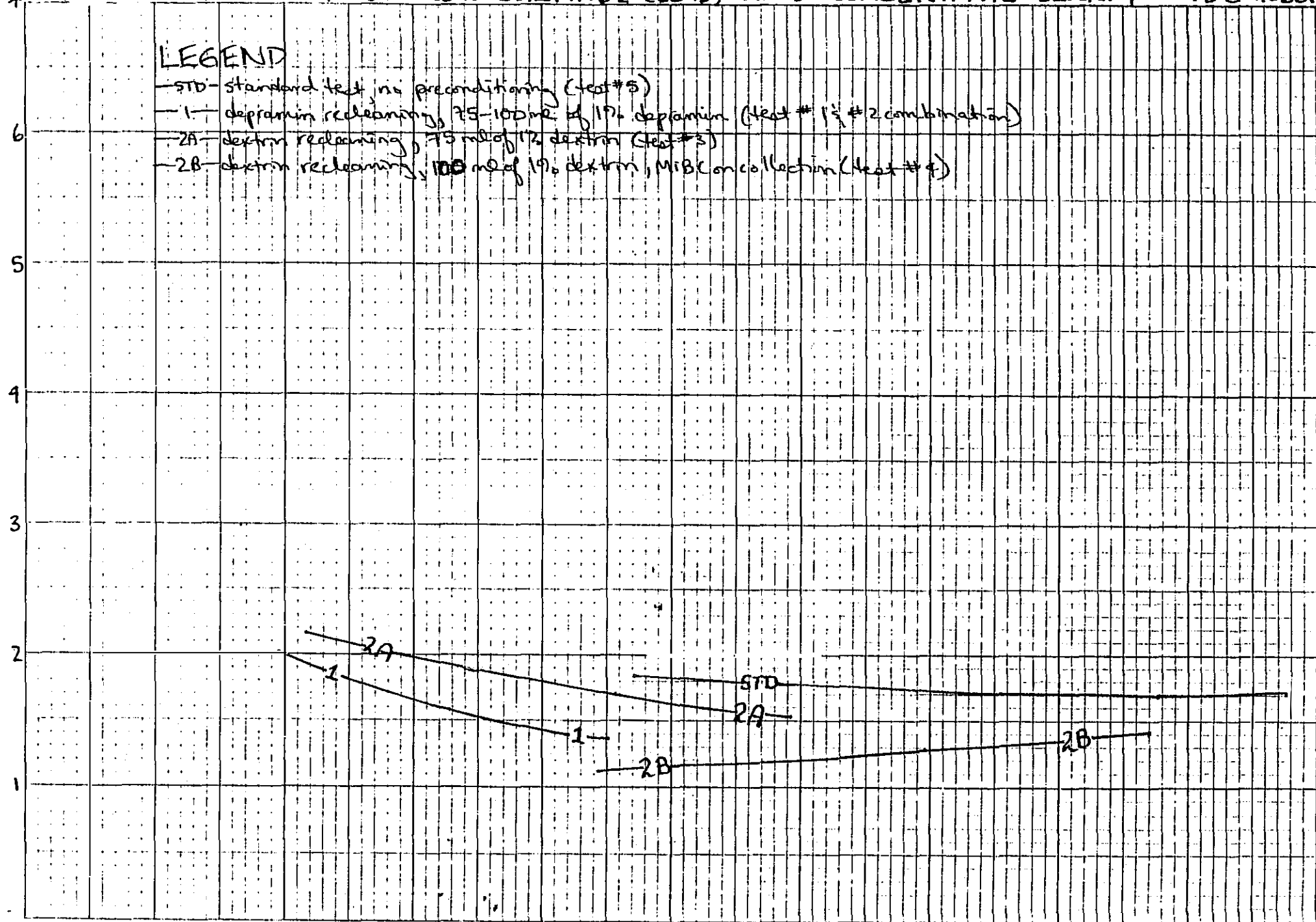
- STD - standard test, no preconditioning (test #5)
- 1 - depramin reclamation, 75-100 ml of 1% depramin (test #1 & #2 combination)
- 2A - dextrin reclamation, 75 ml of 10% dextrin (test #3)
- 2B - dextrin reclamation, 100 ml of 10% dextrin, MIBC on collection (test #4)

# TESTING ON LOW SULPHIDE (50%) LEAD CONCENTRATE SLURRY - 9% CARBON

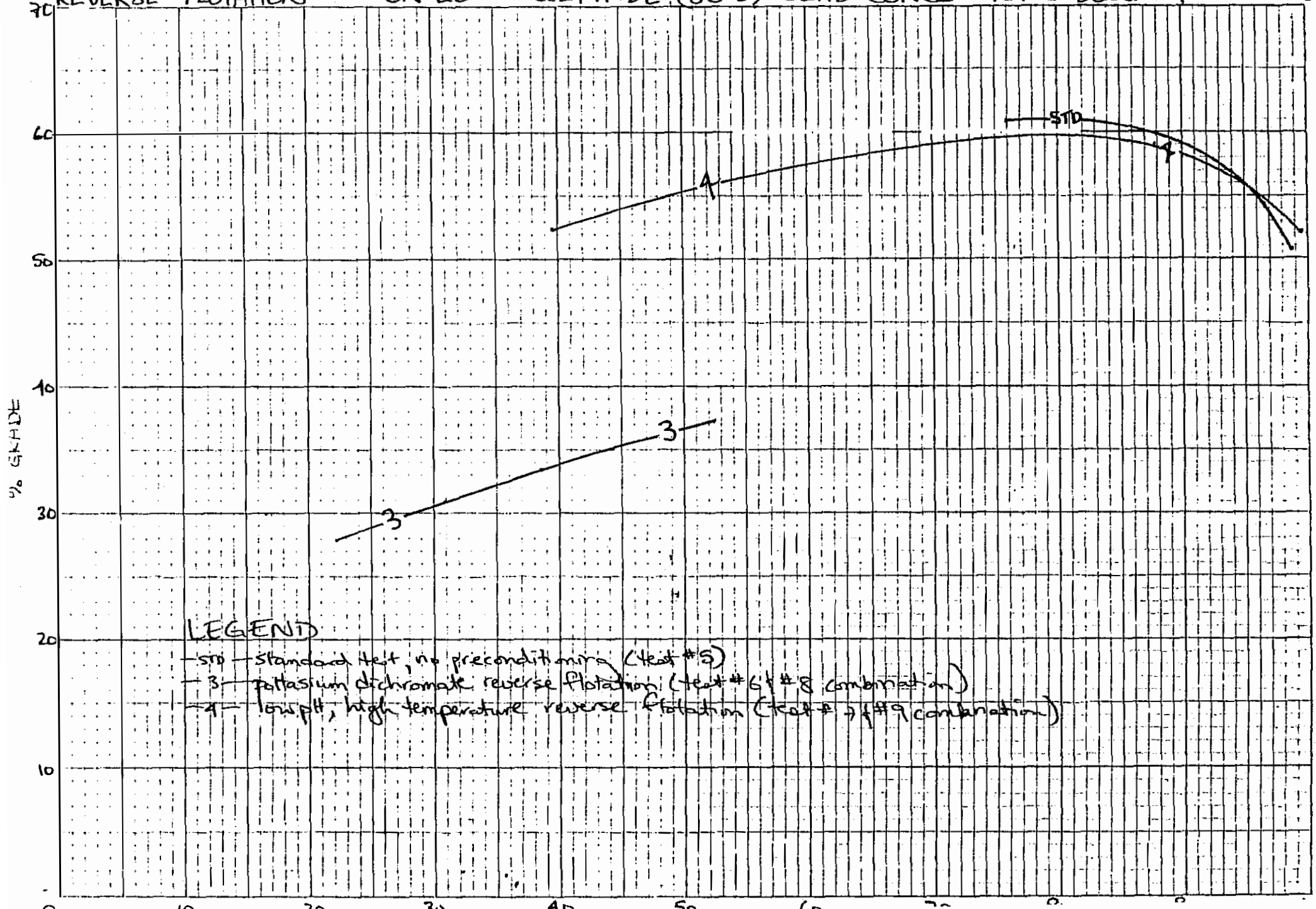
## LEGEND

- STD - standard test, no preconditioning (test # 5)
- 1 - deprimin reclamation, 75-100 ml of 1% deprimin (test # 1 & # 2 combination)
- 2A - dextrin reclamation, 75 ml of 1% dextrin (test # 3)
- 2B - dextrin reclamation, 100 ml of 1% dextrin, MIBC on collection (test # 4)

% GRADE

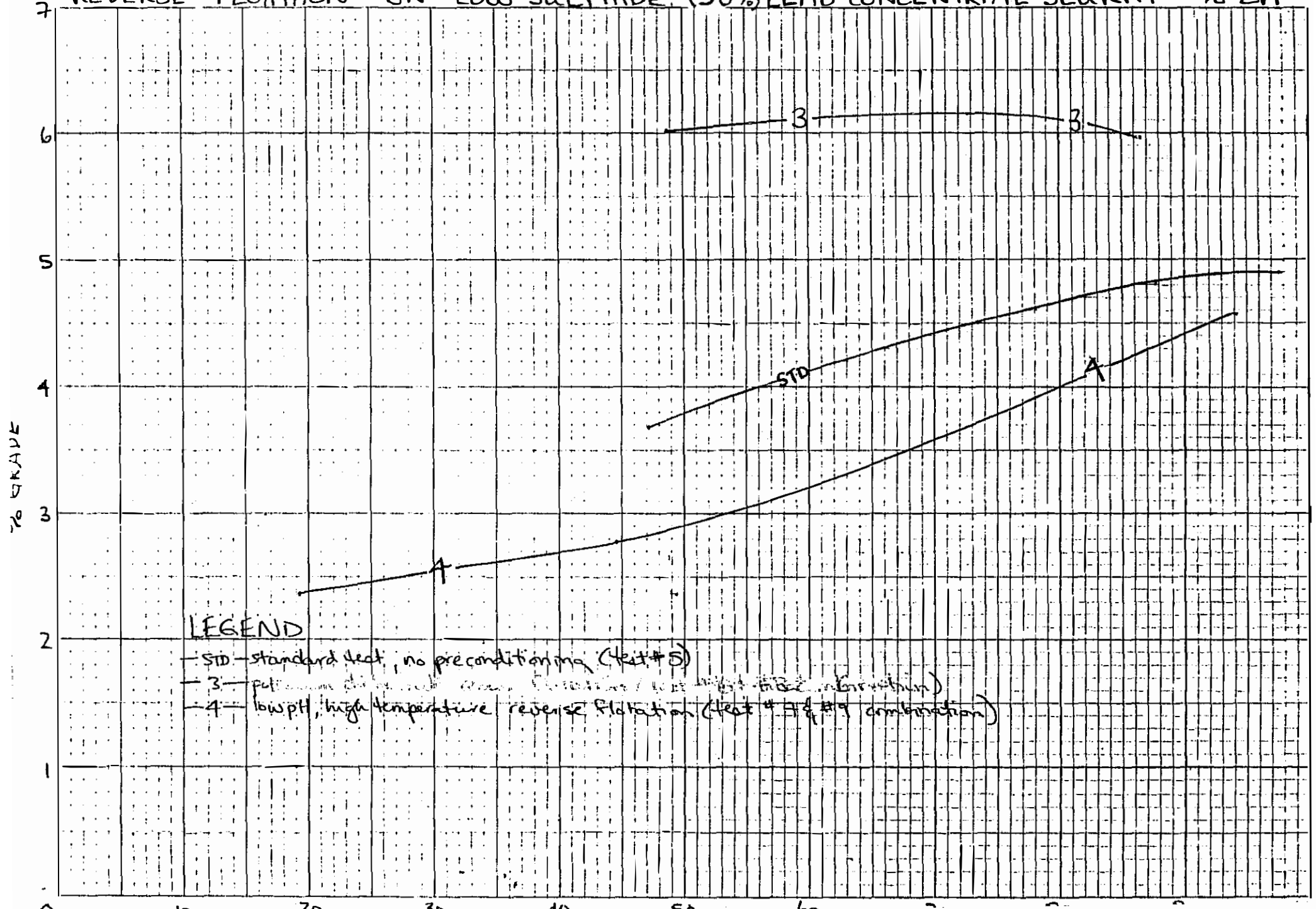


# REVERSE FLOTATION ON LOW SULPHIDE (50%) LEAD CONCENTRATE SLURRY - 9% Pb



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# REVERSE FLOTATION ON LOW SULPHIDE (50%) LEAD CONCENTRATE SLURRY - % Zn



## LEGEND

- STD - standard test, no preconditioning (test # 5)
- 3 - flotation with standard reagents (test # 7 & 8 combination)
- 4 - low pH, high temperature reverse flotation (test # 7 & 9 combination)

# 7 REVERSE FLOTATION ON LOW SULPHIDE (50%) LEAD CONCENTRATE SLURRY - % CARBON

## LEGEND

- STD - standard test, no pre-conditioning (test # 5)
- 3 - potassium dichromate reverse flotation (test # 6 / # 8 combination)
- 4 - low pH, high temperature reverse flotation (test # 7 / # 7 combination)

% SULPHIDE

