

NASA CR.

141451

TECHNICAL NOTE

PROCESSING OF SL-4 ROLL 51, S190A UNFILTERED 2443 ORIGINAL

(NASA-CR-141451)	PROCESSING OF SL-4 ROLL	N75-14099
51, S190A UNFILTERED 2443 ORIGINAL		
(Technicolor Graphic Services, Inc.)		
37 p HC \$3.25	CSSL 14E	Unclass
		63/35 05759

Prepared Under

Contract NAS 9-11500  
Task Order HT-105

Prepared By

Harold E. Lockwood  
Phot Scientist

June 1974

PHOTOGRAPHIC TECHNOLOGY DIVISION  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
LYNDON B. JOHNSON SPACE CENTER  
HOUSTON, TEXAS



Technicolor Graphic Services, Inc.

PROCESSING OF SL-4 ROLL 51, S190A UNFILTERED 2443 ORIGINAL

This Report has been reviewed  
and is approved.

o

SUBMITTED BY:

Harold E. Lockwood  
Harold E. Lockwood, Photoscience

APPROVED:

Gerard E. Sauer  
Gerard E. Sauer, Manager  
Photo Science Office

CONCURRENCE:

D. H. G. Howe  
D. H. G. Howe, Operations Manager

APPROVED:

Noel T. Lamar  
Noel T. Lamar, Technical Monitor

CONCURRENCE:

John R. Brinkmann  
John R. Brinkmann, Chief  
Photographic Technology Division

## PROCESSING OF SL-4 ROLL 51, S190A UNFILTERED 2443 ORIGINAL

### I. GENERAL:

The required yellow filter was not placed on the camera during the exposure of Skylab 4, S190A experiment, Roll 51. Roll 51 was film type 2443, Kodak Color Infrared Film, which results in an overexposed, predominantly magenta image when the yellow filter is omitted.

Radiometric or photometric data from Roll 51 was severely degraded because blue light, normally filtered out, contaminated all layers of the imagery.

PTD was instructed to process Roll 51 so that the results would appear near normal. Those results and the testing preliminary to processing the original are summarized here.

### II. PRE-PROCESS TESTING:

Prior to processing Roll 51 extensive sensitometric and aircraft simulation tests were conducted to determine the character of the image degradation due to yellow filter omission. A speed loss was required for each layer varying from the largest loss required in the infrared sensitive layer (about 2 stops), to about 1 stop in the green sensitive layer and less than 1 stop in the red sensitive layer.

Eastman Kodak was directed to recommend a modified process for the Versamat 1811 EA-5 reversal chemical process which would correct the sensitometric results to near normal even though radiometric results cannot be corrected due to subject reflectance unknowns.

This process was termed cosmetically correct in project discussions.

Prior to receiving Kodak's recommendations, PTD conducted a test series as documented in Appendix A.

These tests resulted in an infrared layer loss of 1.3 stops, a red sensitive layer loss of 0.67 stops and green sensitive layer loss of 0.67 stops. The operating parameters included the addition of Anti-Fog #6 to the First Developer, Neutralizer, and Prehardener, lowering of color developer pH to 11.10 and an increase in machine speed to 10 feet per minute. These results demonstrated the difficulties in selectively changing effective speed of the three layers of 2443 and provided an insight into some possible methods for achieving some changes.

Eastman Kodak's recommendations, based on experience at their research facility were:

- Change color developer pH to 11.0 from 11.60
- Add MX-870 neutralizer to EA-5 neutralizer in a 1:1 ratio
- Add Anti-Fog #6 to the EA-5 neutralizer in 50 milligrams per liter increments to reduce cyan dye layer (infrared sensitive) speed as necessary.

### III. ORIGINAL PROCESSING:

The original roll of 2443, Roll 51, was processed by PTD in a Versamat 1811 with EA-5 chemistry modified as follows:

- A color developer pH of 11.05
- MX-870 neutralizer added to EA-5 neutralizer in a 1:1 ratio
- The first developer temperature was lowered 10°F. to 100°F.

The certification sensitometric curve for Roll 51 is attached for reference as Figure 1.

IV. CONCLUSIONS:

The process produced results which satisfied the cosmetically correct specification.

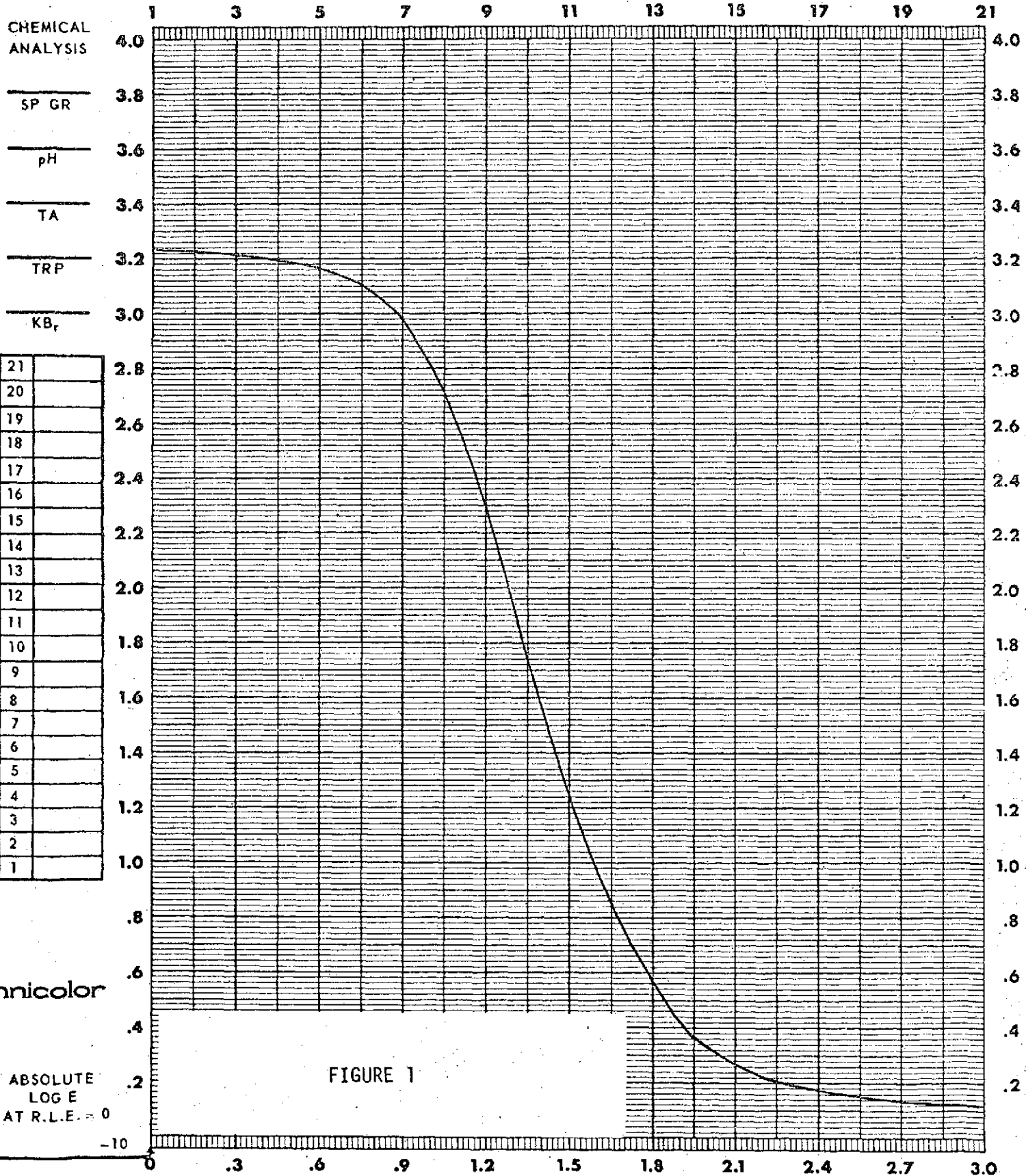
A review of the Roll 51 imagery demonstrated that densities were close to those predicted and on the straight line portion of the characteristic curve.

Color balance was acceptable showing a noticeable color change only in water which appeared magenta rather than blue.

The sensitometric speed relationships were acceptable with the infrared sensitive layer being about one-half stop fast and the visual speed about one-half stop fast.

FILM 2443 EMULSION # 116-3 MFG EK EXPIRATION DATE \_\_\_\_\_

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>Versamat 1811 #3</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>EA-5 mod.</u>	TYPE	<u>TD504</u>
TIME	<u>1/50</u> SEC.	SPEED	<u>7</u> TANKS FPM	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5500°K</u>	TEMP °F	<u>100</u> TIME	FILTER	<u>Visual</u>
					SPEED ( )
					D-MAX
					GAMMA
					BASE + FOG



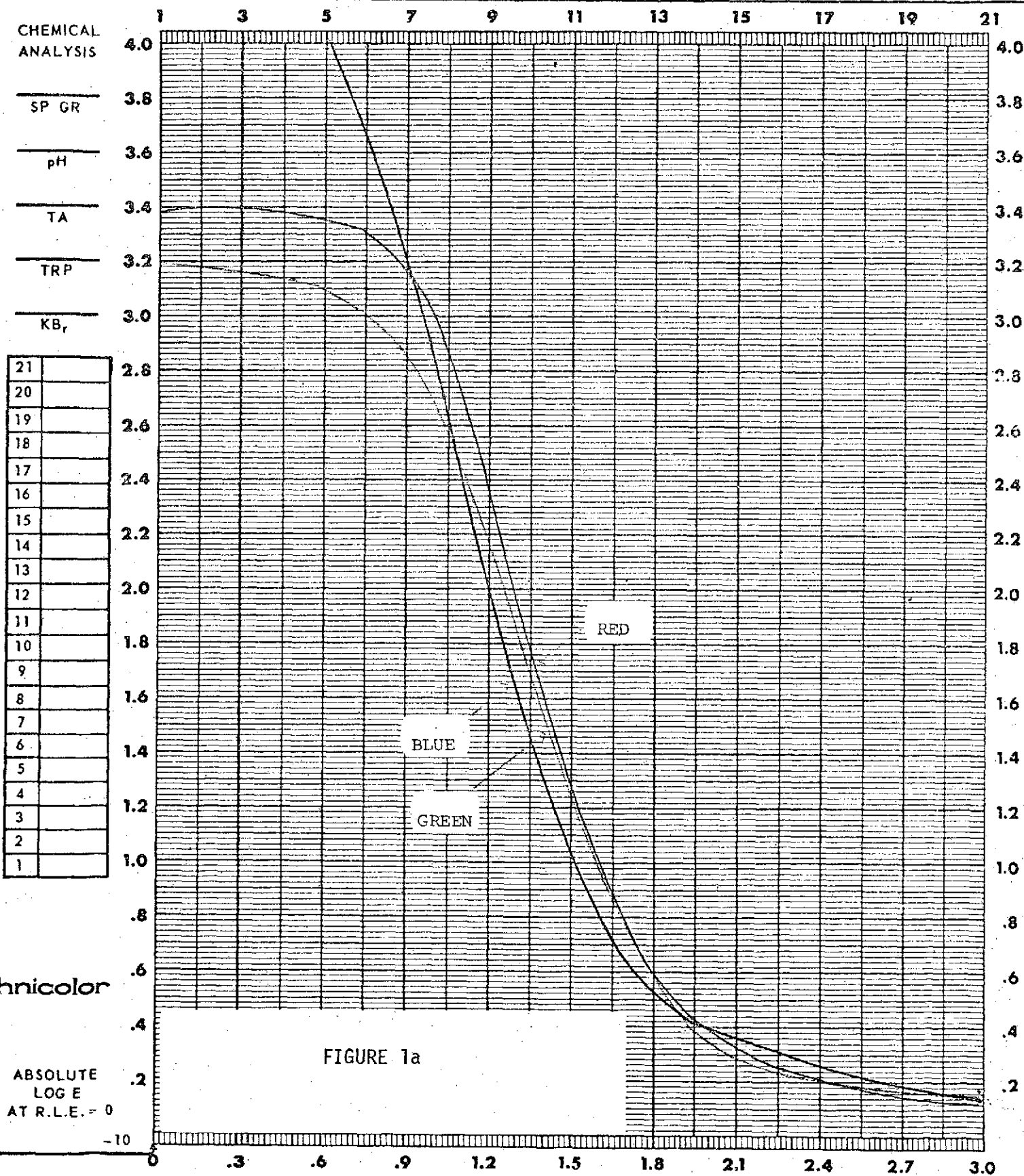
21	
20	
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	

Technicolor

ABSOLUTE  
LOG E  
AT R.L.E. = 0

-10

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	I-B	PROCESSOR	Versamat 1811 #3	INSTRUMENT	MacBeth
ILLUMINANT	2850 °K	CHEMISTRY	EA-5 mod	TYPE	TD504
TIME	1/50 SEC.	SPEED	TANKS 7 FPM	APERTURE SIZE	3 MM
FILTER	5500°K	TEMP °F	100 TIME	FILTER	Status A
					SPEED ( )
					D-MAX
					GAMMA
					BASE + FOG



APPENDIX A

PTD TESTS ON TYPE 2443 FILM  
EXPOSED WITHOUT A WRATTEN 12 FILTER





Technicolor

INTEROFFICE CORRESPONDENCE

TO Harold Lockwood

DATE June 10, 1974

COPIES

FROM Lincoln Perry

SUBJECT Process Modification Tests for Unfiltered 2443 Film

Attached is a summary of process modification tests performed by Chuck Klein, on May 18 and 20, 1974.

These tests, while not producing the desired final result, provided valuable information of the effect of chemical and mechanical variations on 2443 film. The knowledge gained was put to good use when the flight film was processed.

Lincoln Perry, Supervisor  
Chemical Mix and Process Control

LP/rc

TESTS ON TYPE 2443 FILM  
EXPOSED WITHOUT A WRATTEN 12 FILTER

I. PURPOSE:

To produce a modified EA-5 process that would yield an apparently normal sensitometric step tablet, even though the film had been exposed without a Wratten 12 filter.

II. APPARATUS:

- A. Kodak 1811 Color Processor with EA-5 Color Chemistry
- B. Mead/Data Densitometer System
- C. Kodak I-B Sensitometer

III. MATERIALS:

- A. Film type 2443-116-3, normally exposed (1/50, 5500°K, Wratten 12 filter)
- B. Film Type 2443-116-3, exposed (1/50, 5500°K filter only)
- C. Kodak Anti-Fog Agent #6
- D. 18 Normal Sulphuric Acid (18N-H<sub>2</sub>SO<sub>4</sub>)

IV. TEST PROCEDURES:

The first two tests involved the processing of two sensitometric strips exposed (1) normally, and (2) with 5500°K filtration only. These strips were processed to standard sensitometric control (110°F. first developer, 7 fpm) for that film type. The resultant plots of these strips graphically depicted how far the unfiltered layers would have to be shifted to match the standard control for 2443-116-3 with Wratten 12 filtration. At a density of 1.40, the RED layer required a speed loss of 0.54; the GREEN layer required a speed loss of 0.21; and the BLUE layer required a speed loss of 0.35 log exposure increments.

A third processing test was run to determine the effect of shorter processing time on the desired curve shape. The processor speed was increased from 7 to 10 feet per minute. The overall reduction in process time produced some desirable affects, however, the test yielded an undesirable toe shape to the D-log E curve. It was then decided that chemical additions could be used to selectively retard development in the individual layers without the undesirable affects.

Therefore, for Tests 4 and 5, two additions of Anti-Fog Agent #6 were made to the Prehardener. The sensitometric results showed a shifting of all the layers closer to the desired speed and density. Unfortunately, an undesirable "bump" was produced in the toe of the BLUE layer.

Tests 6 and 7 were pursued to correct the condition of the BLUE layer. By adding sulfuric acid to the color developer, the pH was lowered from 11.65 (normal) to 11.10. The resultant plots of these tests showed a great improvement in the toe shape of the BLUE layer; the remaining layers were virtually unaffected in any area that could be significant. In addition, these tests produced a one-third of a stop gain in speed.

In an attempt to further decrease the speed of all of the layers, an eighth test was conducted. By the addition of Anti-Fog Agent #6 to the Neutralizer, a speed decrease was evident in the GREEN and BLUE layers, and the BLUE layer toe shape was also improved slightly. In any of the measurable portions of the D-log E curve, there was very little affect on the RED layer.

Test 9 was an attempt to directly retard development in the first developer. The addition of Anti-Fog Agent #6 yielded favorable results in that the speed of the RED and GREEN layers decreased

significantly, with only a slight decrease in the BLUE layer. Unfortunately, the toe shape of the BLUE layer was not significantly improved.

At this stage in testing, the processor was covered to retard oxidation and possible contamination and left at room temperature for a 48-hour period. A test was then conducted to determine the extent of oxidation of the Anti-Fog Agent and the effect on 2443 without the Wratten 12 filter.

Two final tests were made after the addition of Anti-Fog Agent #6 to the first developer. Results of the tests and the cumulative results of the entire series are listed in the following section.

#### IV. TEST RESULTS:

Cumulative results of the aforementioned tests netted the following results:

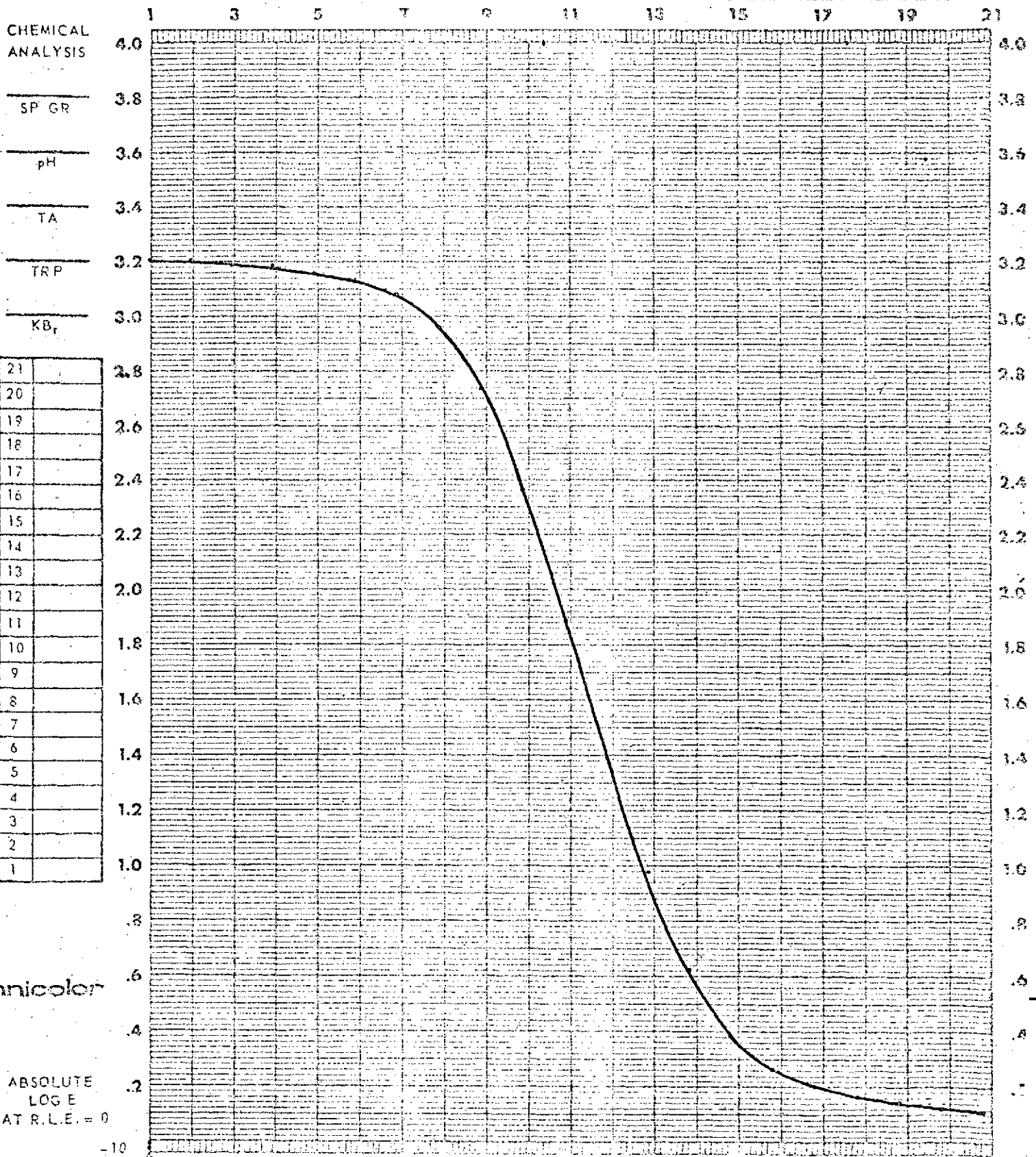
<u>Layers</u>	<u>Speed Decrease</u>	<u>Comments</u>
Red	1 1/3 stops	1/2 stop short of desired
Green	2/3 stop	.01 log E over desired
Blue	2/3 stop	1/3 stop short of desired

Sensitometric curves, numbered to correspond with test numbers, are attached for your reference.

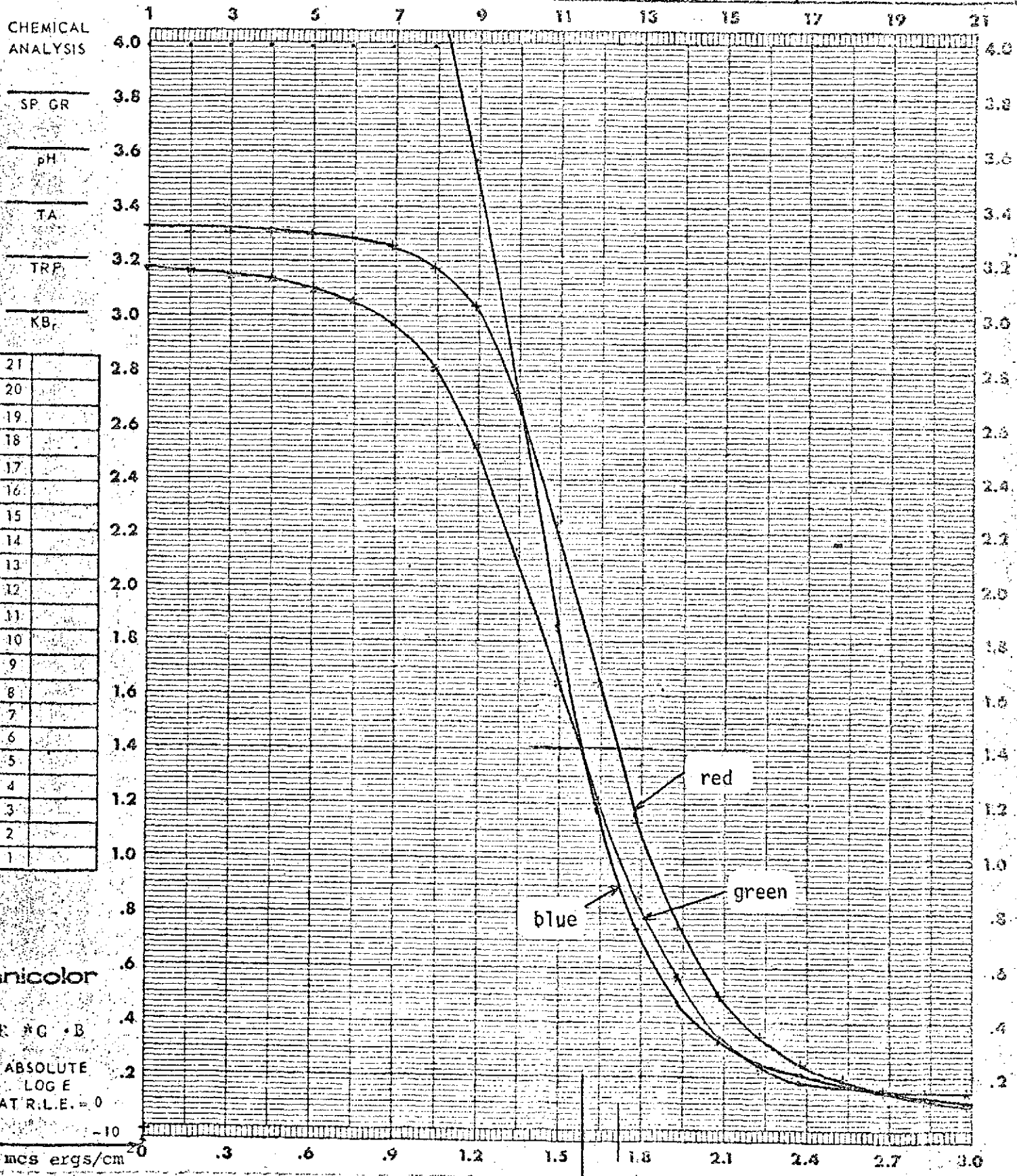
DATE 5-18-74 CONTROL # ① TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

FILM 2443 EMULSION # 116-3 MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

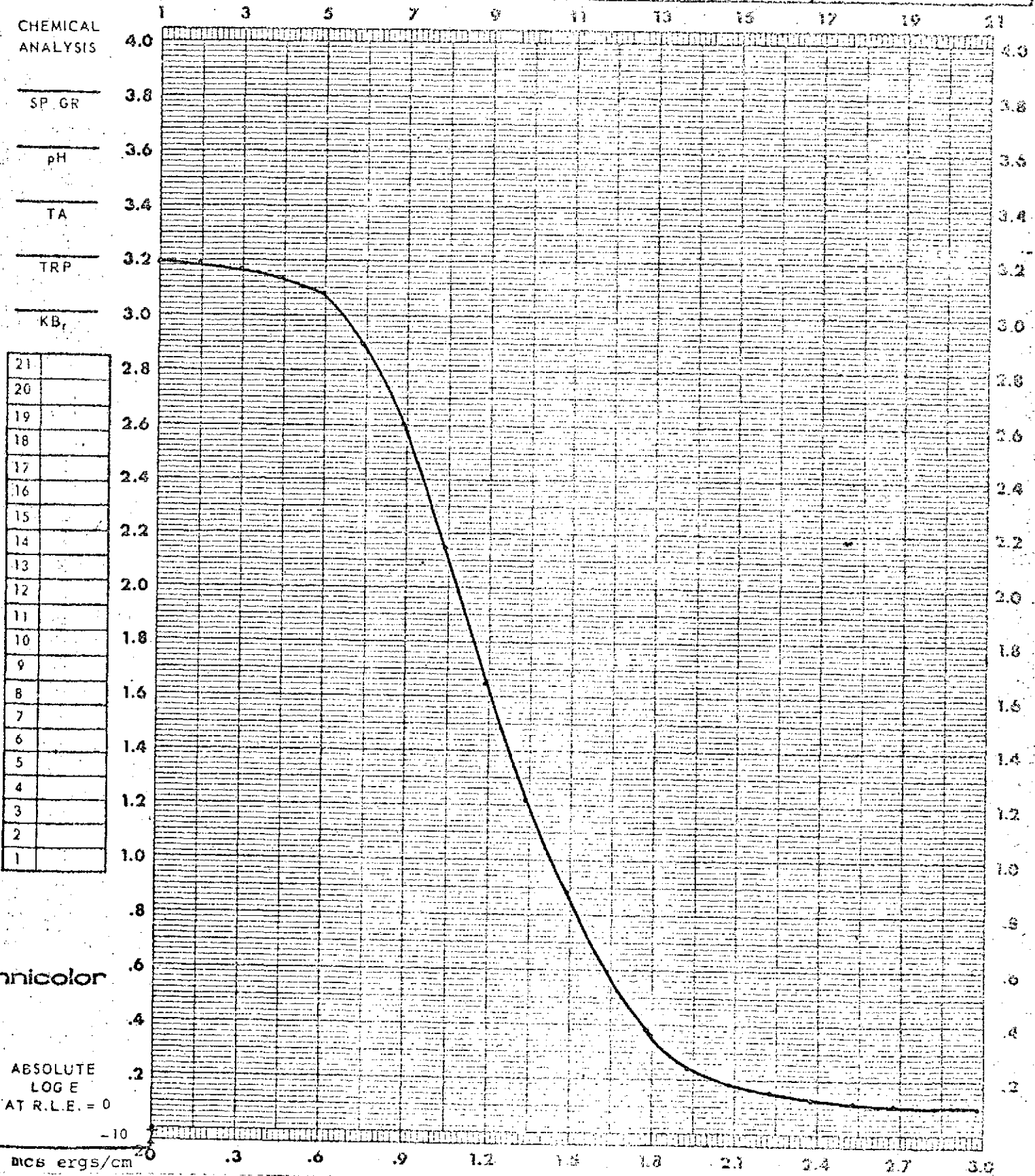
EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER <u>18</u>		PROCESSOR <u>1211 #3</u>		INSTRUMENT <u>MacBeth</u>	SPEED ( ) _____
ILLUMINANT <u>2850</u>	°K	CHEMISTRY <u>EA 5</u>		TYPE <u>T6504</u>	D-MAX _____
TIME <u>1/50</u>	SEC.	SPEED _____	TEMP. <u>7</u>	APERTURE SIZE <u>3</u>	GAMMA _____
FILTER <u>SS00 + Wr 12</u>		TEMP. TIME _____		FILTER <u>VISUAL</u>	BASE + FOG _____



EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER <u>1B</u>		PROCESSOR <u>1811 #3</u>		INSTRUMENT <u>MacBeth</u>	SPEED ( )
ILLUMINANT <u>2850</u> °K		CHEMISTRY <u>EAS</u>		TYPE <u>TDS04</u>	D-MAX
TIME <u>150</u> SEC.		SPEED _____ TANKS <u>7</u> FPM		APERTURE SIZE <u>3</u> MM	GAMMA
FILTER <u>SS00 wr 12</u>		TEMP °F <u>110</u> TIME _____		FILTER <u>STATUS A</u>	BASE + FOG



EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811 H3</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>EA-5</u>	TYPE	<u>TDS04</u>
TIME	<u>1/50</u> SEC.	SPEED	<u>TANKS 7</u>	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5500</u>	TEMP °F	<u>110</u> TIME	FILTER	<u>VISUAL</u>
					SPEED ( )
					D-MAX
					GAMMA
					BASE FOG



DATE S-18-74 CONTROL # 2 TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

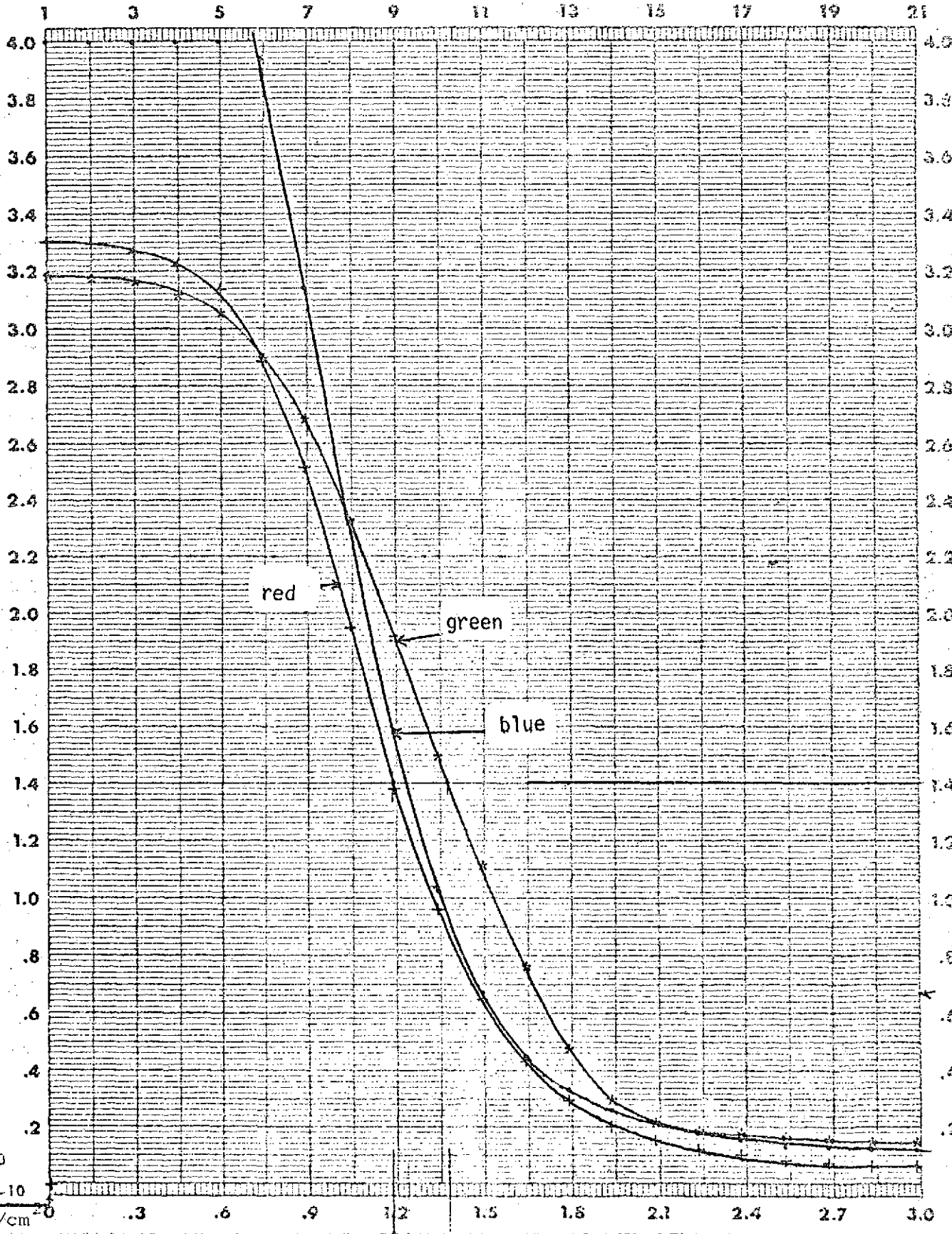
FILM 2443 EMULSION # 116-3 MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER <u>IB</u>		PROCESSOR <u>1811 #3</u>		INSTRUMENT <u>MacBeth</u>	SPEED ( )
ILLUMINANT <u>2856 °K</u>		CHEMISTRY <u>EA-8</u>		TYPE <u>TB504</u>	D-MAX
TIME <u>150</u> SEC.		SPEED _____ TANKS <u>7</u> FPM		APERTURE SIZE <u>3</u> MM	GAMMA
FILTER <u>5500</u>		TEMP °F <u>10</u> TIME _____		FILTER <u>STATUS A</u>	BASE : FOG

CHEMICAL ANALYSIS

- SP GR \_\_\_\_\_
- pH \_\_\_\_\_
- TA \_\_\_\_\_
- TRP \_\_\_\_\_
- KB<sub>r</sub> \_\_\_\_\_

21	
20	
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	



Technicolor

+R \*G \*B

ABSOLUTE LOG E  
A.T.R.L.E. = 0

mcs ergs/cm<sup>2</sup>

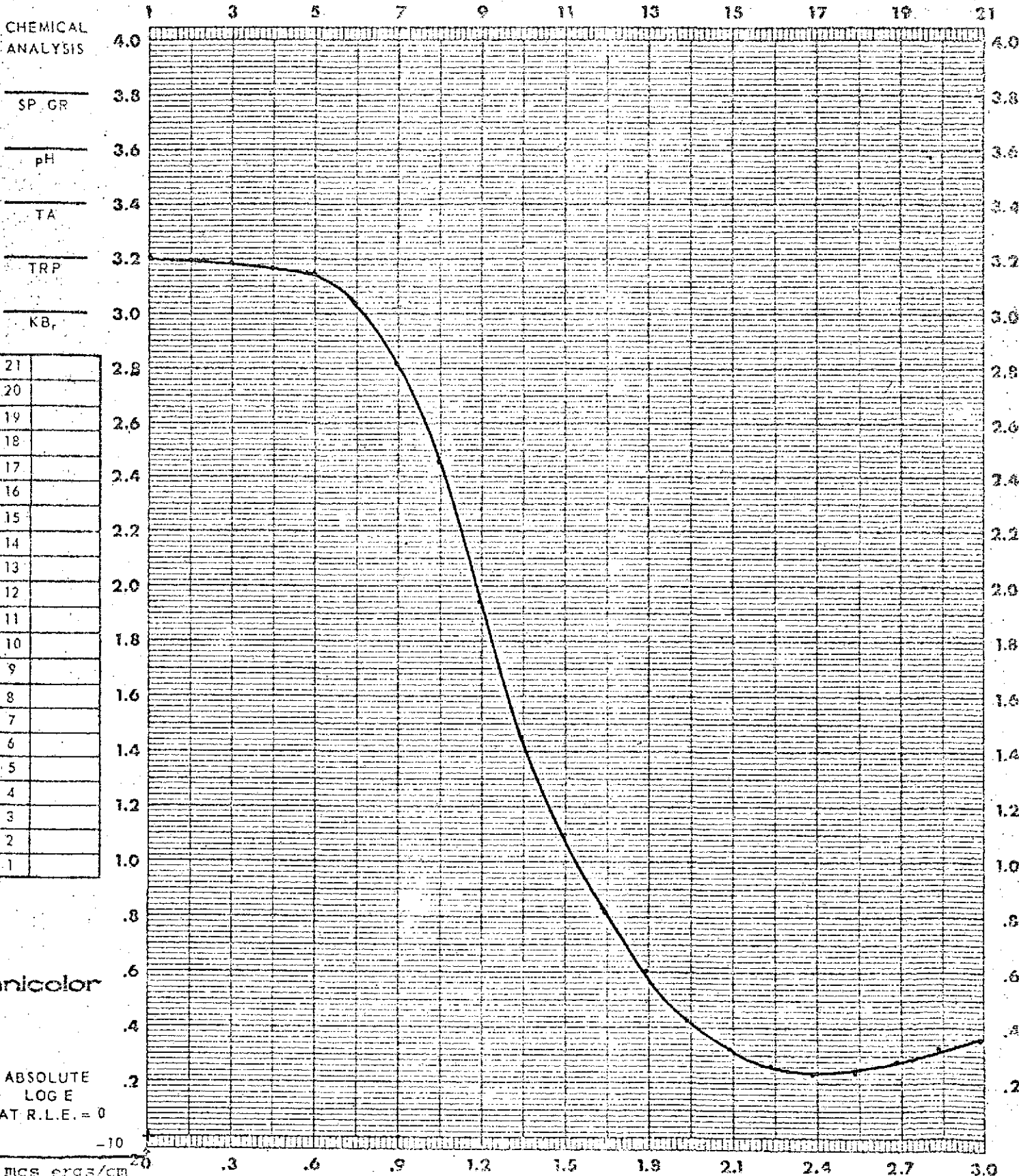


DATE 5-18-73 CONTROL # \_\_\_\_\_ TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

FILM 2443 EMULSION # 116-3 MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

(3)

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811 #3</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850</u> °K	CHEMISTRY	<u>EA-5</u>	TYPE	<u>TD 504</u>
TIME	<u>150</u> SEC.	SPEED	TANKS <u>10</u> FPM	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5500</u>	TEMP °F	<u>110</u> TIME	FILTER	<u>VISUAL</u>
					SPEED ( )
					D-MAX
					GAMMA
					BASE + FOG

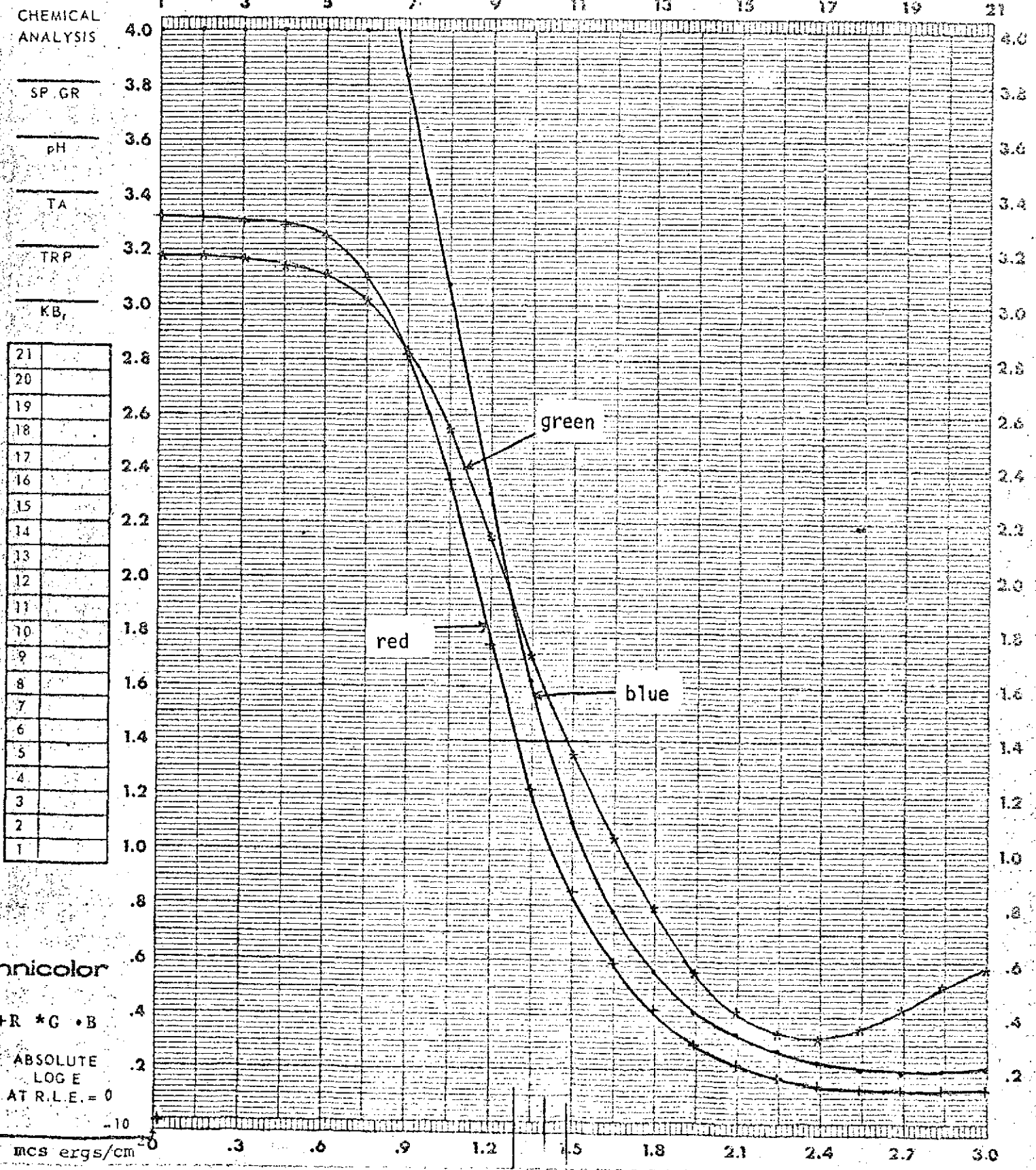


Technicolor

ABSOLUTE  
LOG E  
AT R.L.E. = 0

microns/cm

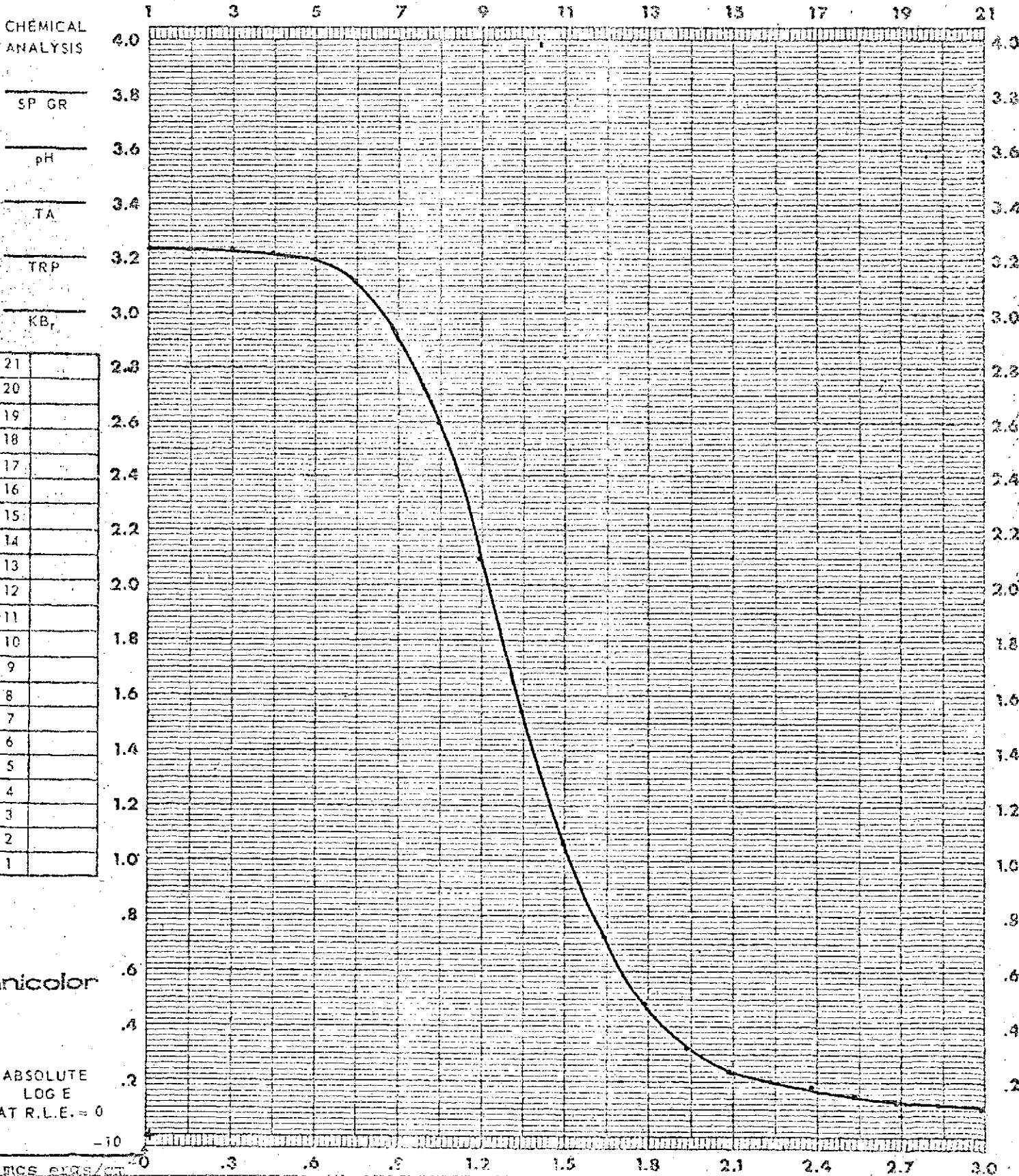
EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>EB</u>	PROCESSOR	<u>1811 #3</u>	INSTRUMENT	<u>MocBeth</u>
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>EA 5</u>	TYPE	<u>T604</u>
TIME	<u>1/50</u> SEC.	SPEED	<u>10</u> TANKS	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5500</u>	TEMP °F	<u>110</u> TIME	FILTER STATUS	<u>A</u>
					SPEED ( )
					D-MAX
					GAMMA
					BASE FOG



DATE 5-18-74 CONTROL # \_\_\_\_\_ TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

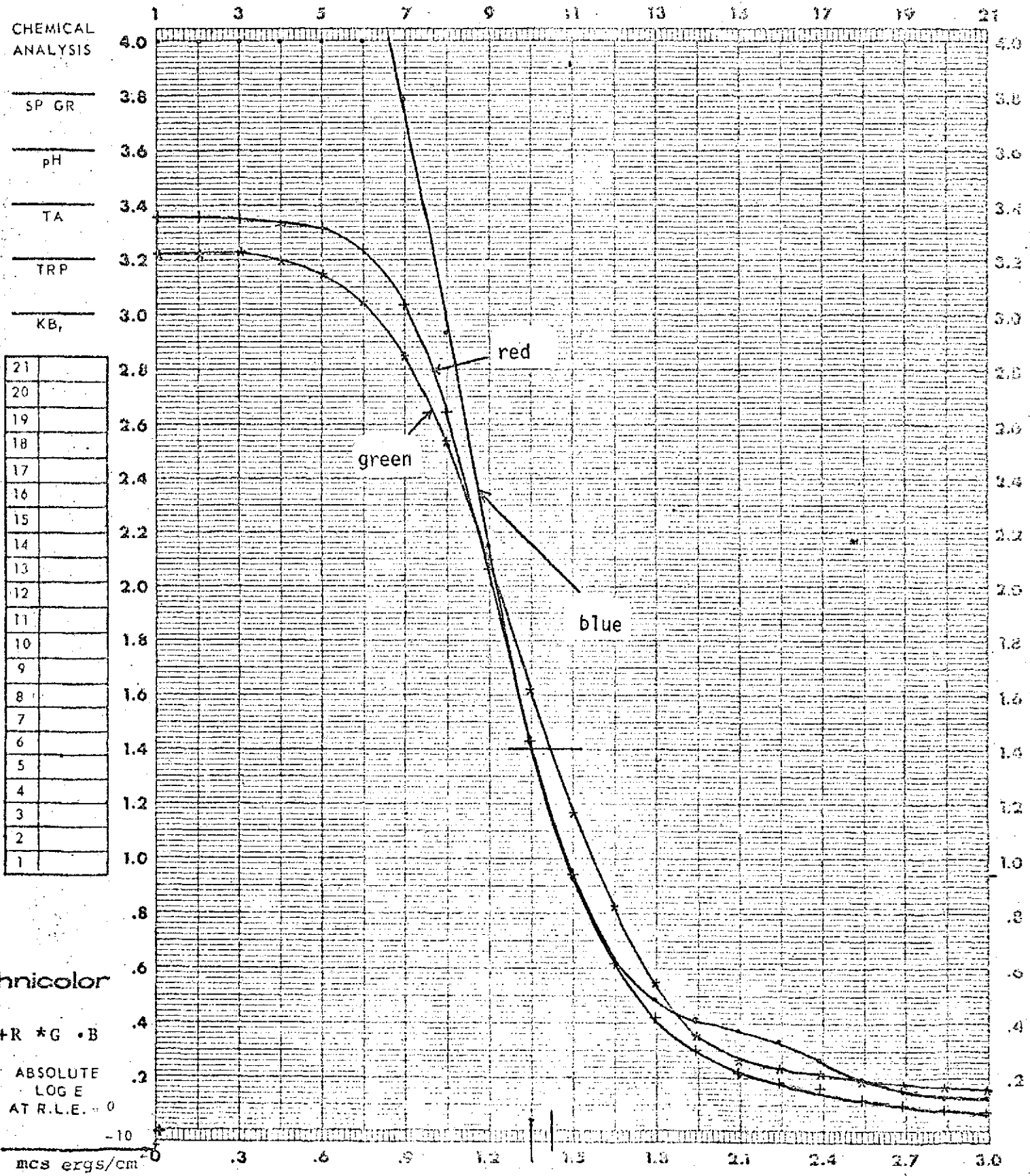
FILM 2443 EMULSION # 116-3 MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850</u> °K	CHEMISTRY	<u>EA-5</u>	TYPE	<u>To504</u>
TIME	<u>1/50</u> SEC.	SPEED	<u>7</u> FPM	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5500</u>	TEMP °F	<u>110</u>	TEMP °C	<u>TIME</u>
				FILTER	<u>VISUAL</u>
					SPEED ( )
					D-MAX
					GAMMA
					BASE + FOG



21	
20	
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>A-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>EA 5</u>	TYPE	<u>TOSOF</u>
TIME	<u>1/50</u> SEC.	SPEED	<u>7</u> TANKS	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5500</u>	TEMP °F	<u>110</u> TIME	FILTER	<u>STATUS A</u>
					SPEED ( )
					D-MAX
					GAMMA
					BASE FOG

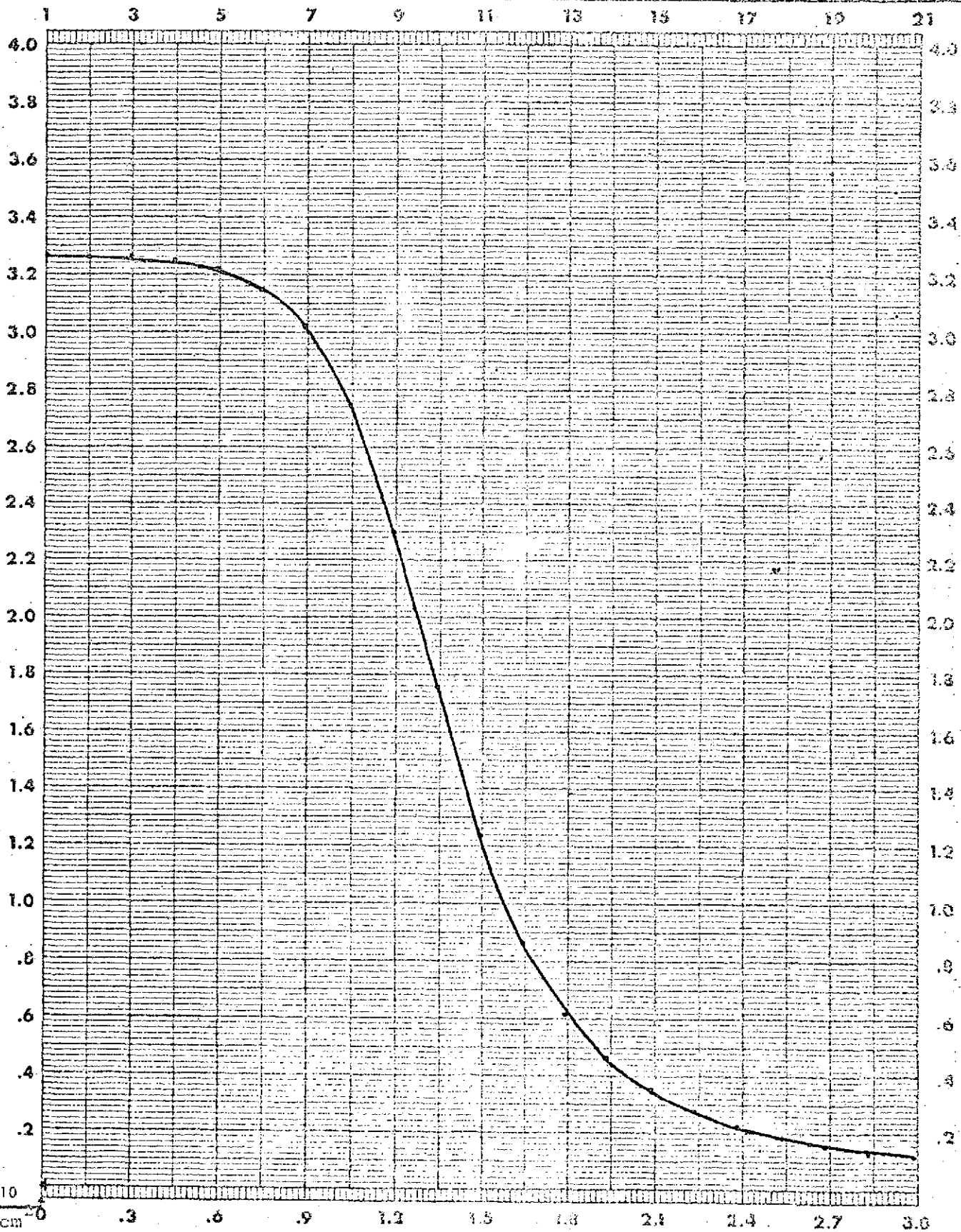


EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER <u>J-B</u>	PROCESSOR <u>1811</u>	INSTRUMENT <u>MacBeth</u>	SPEED ( )		
ILLUMINANT <u>2850 °K</u>	CHEMISTRY <u>EA-5</u>	TYPE <u>T0504</u>	D-MAX		
TIME <u>1/50</u> SEC.	SPEED _____ TANKS <u>7</u> FPM	APERTURE SIZE <u>3</u> MM	GAMMA		
FILTER <u>5500</u>	TEMP °F <u>110</u> TIME _____	FILTER <u>VISUAL</u>	BASE: FCC		

CHEMICAL ANALYSIS

- SP. GR. \_\_\_\_\_
- pH \_\_\_\_\_
- TA \_\_\_\_\_
- TRP \_\_\_\_\_
- KB<sub>r</sub> \_\_\_\_\_

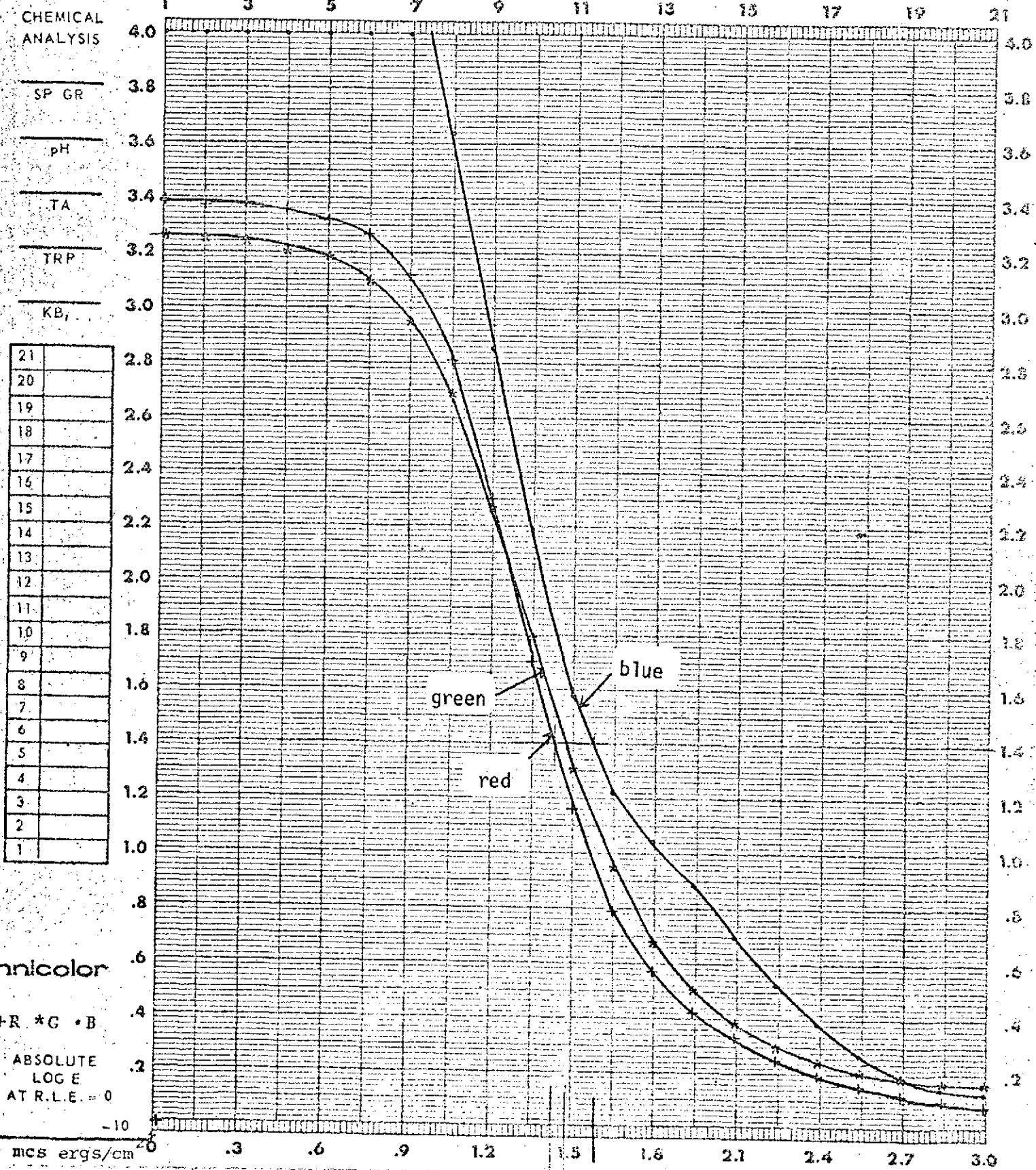
21	
20	
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	



DATE 5-18-74 CONTROL # (5) TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

FILM 2443 EMULSION # 116-3 MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>EA-5</u>	TYPE	<u>T1504</u>
TIME	<u>1/50</u> SEC.	SPEED	<u>7</u> TANKS	APERTURE SIZE	<u>3</u> MM
FILTER	<u>8500</u>	TEMP °F	<u>110</u> TIME	FILTER	<u>STATUS A</u>
					SPEED ( )
					D-MAX
					GAMMA
					BASE + FOG

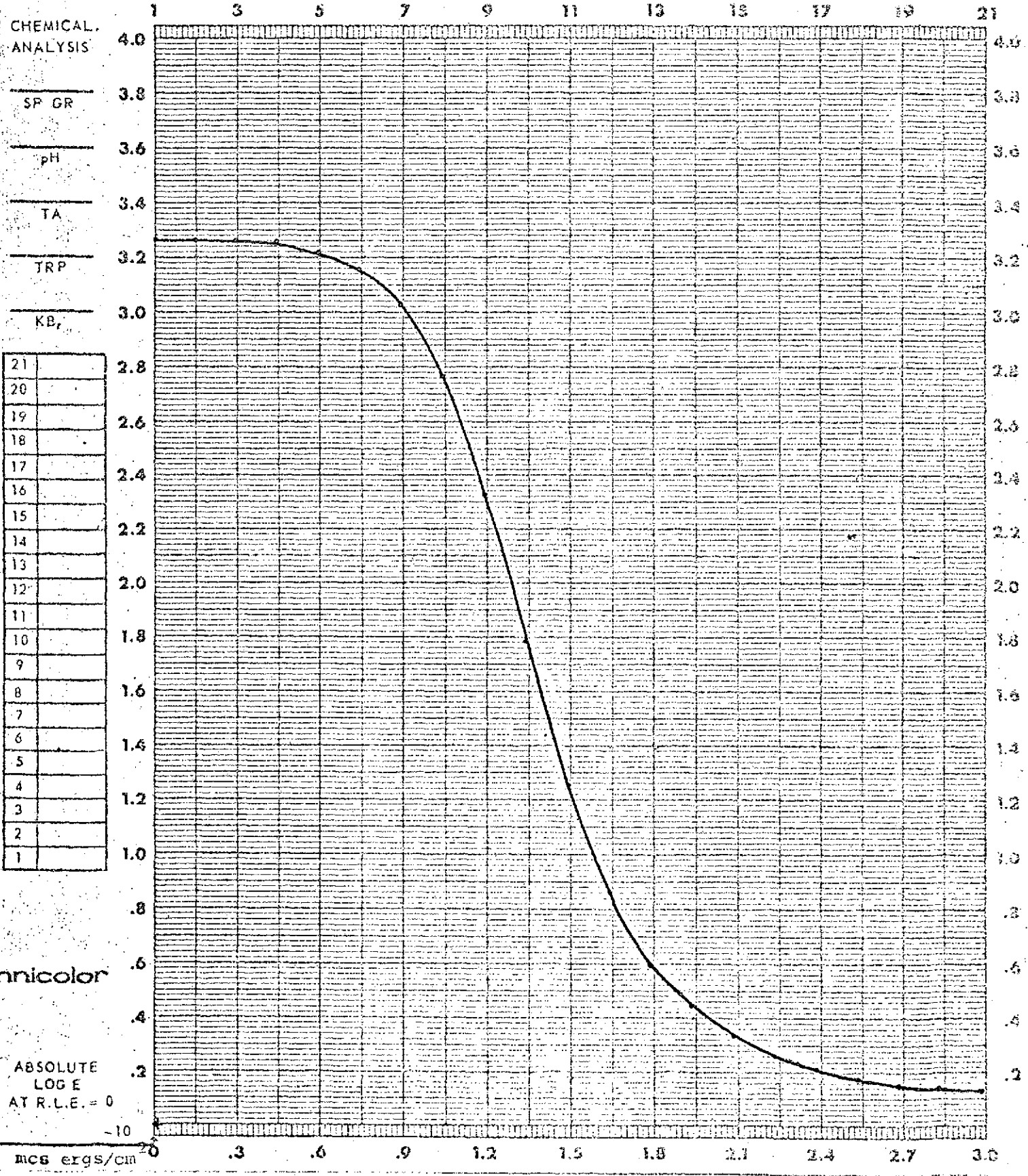


(6)

DATE 5-17-74 CONTROL # \_\_\_\_\_ TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

FILM 2443 EMULSION # 116-3 MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>3850 °K</u>	CHEMISTRY	<u>EA-5</u>	TYPE	<u>TOSU4</u>
TIME	<u>1/50</u> SEC.	SPEED	<u>7</u> TANKS	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5500</u>	TEMP °F	<u>110</u> TIME	FILTER	<u>VISUAL</u>
					SPEED ( )
					D-MAX
					GAMMA
					BASE + FOG



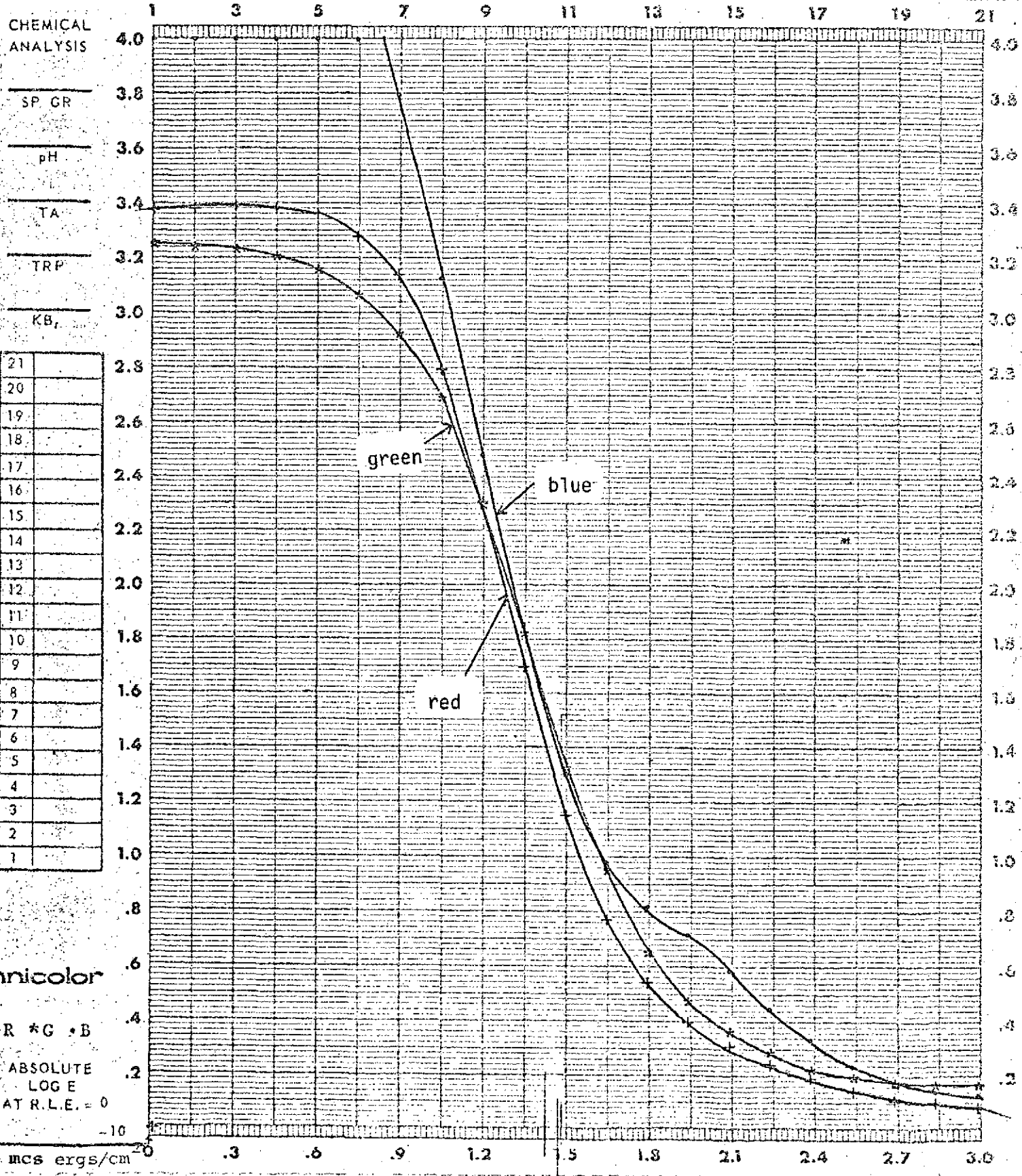
21	
20	
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	

Technicolor

ABSOLUTE LOG E AT R.L.E. = 0

mcs ergs/cm<sup>20</sup>

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>EA-5</u>	TYPE	<u>T0504</u>
TIME	<u>1/50</u> SEC.	SPEED	TANKS <u>7</u> FPM	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5500</u>	TEMP °F	<u>110</u> TIME	FILTER	<u>STATUS 4</u>
					SPEED ( )
					D-MAX
					GAMMA
					BASE + FOG



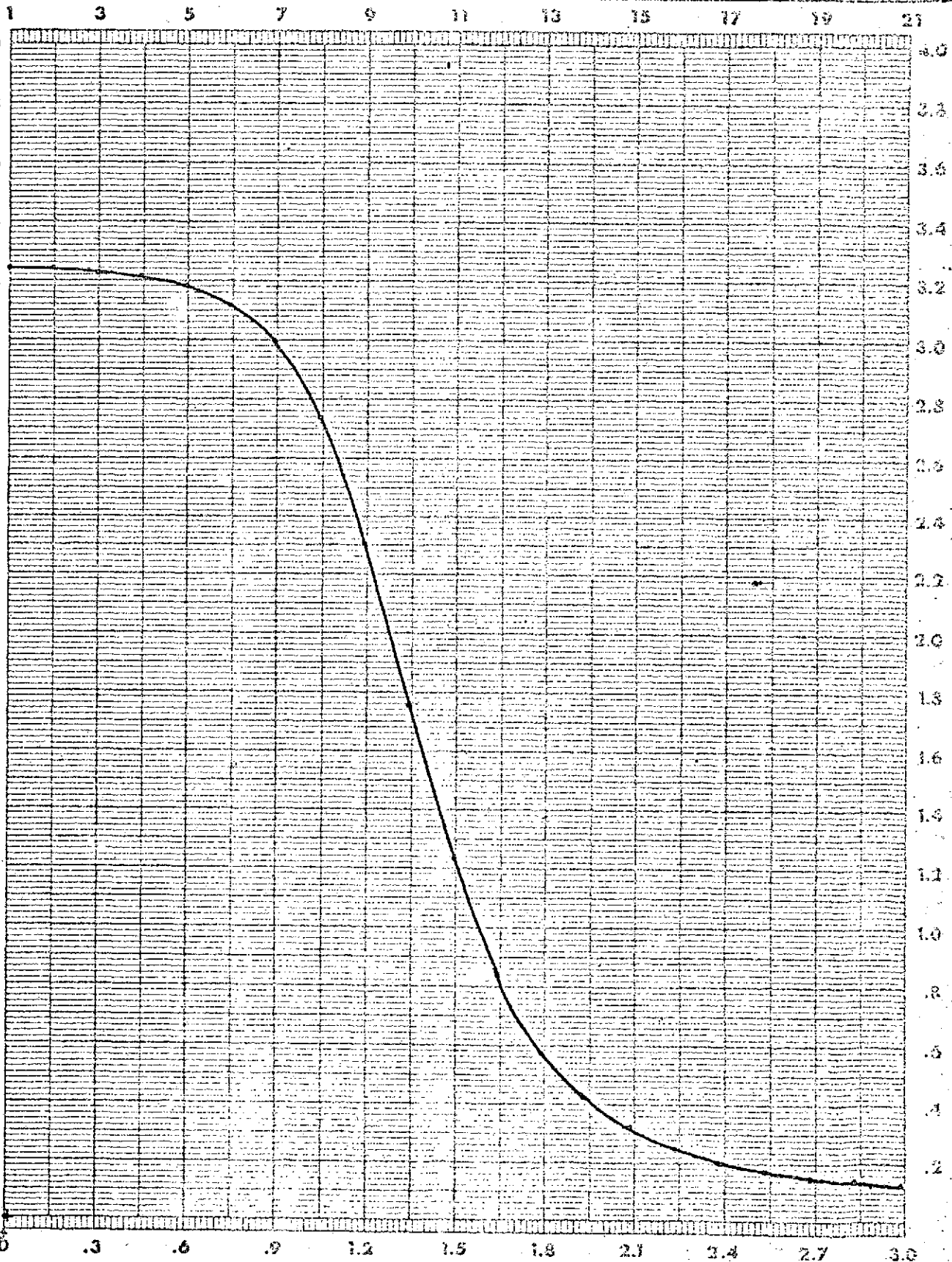


EXPOSURE DATA		PROCESSING DATA			DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>	SPEED ( )
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>EA-5</u>	TYPE	<u>TD504</u>	D-MAX
TIME	<u>150</u> SEC.	SPEED	TANKS <u>7</u>	APERTURE SIZE	<u>3</u> MM	GAMMA
FILTER	<u>5500</u>	TEMP °F	<u>110</u>	TIME	<u>VISUAL</u>	BASE + FOG

CHEMICAL ANALYSIS

- SP GR
- pH
- TA
- TRP
- KB<sub>r</sub>

21	
20	
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	

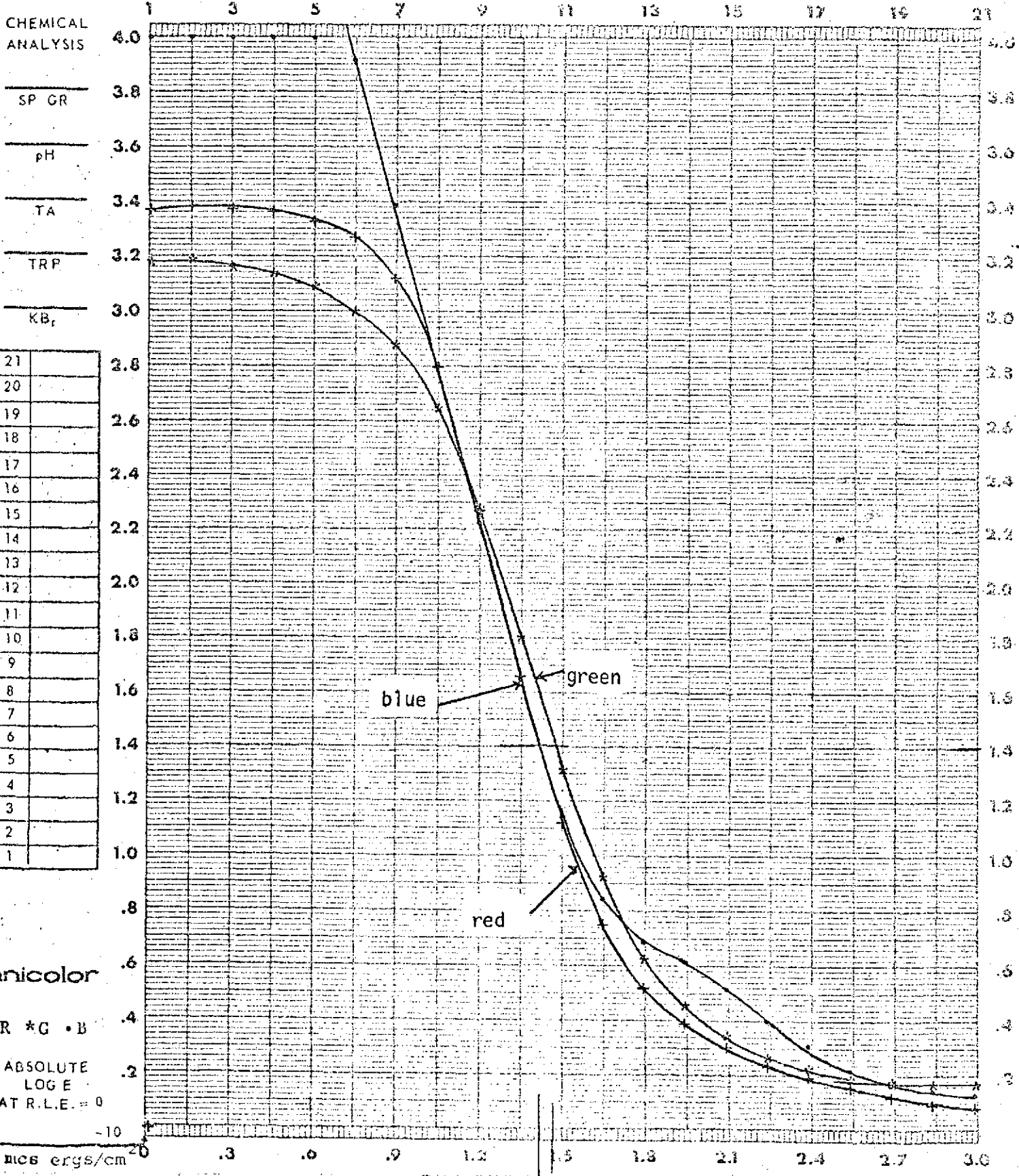


Technicolor

ABSOLUTE LOG E  
AT R.L.E. = 0

mcs ergs/cm<sup>2</sup>

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850</u> °K	CHEMISTRY	<u>EA-5</u>	TYPE	<u>T0504</u>
TIME	<u>1/50</u> SEC.	SPEED	TANKS <u>7</u>	APERTURE SIZE	<u>3</u> mm
FILTER	<u>S500</u>	TEMP °F	<u>110</u> TIME _____	FILTER	<u>STATUS A</u>
				SPEED	
				D-MAX	
				GAMMA	
				BASE	<u>FDG</u>



DATE 5-18-74 CONTROL # \_\_\_\_\_ TASK \_\_\_\_\_ PREPARED BY \_\_\_\_\_

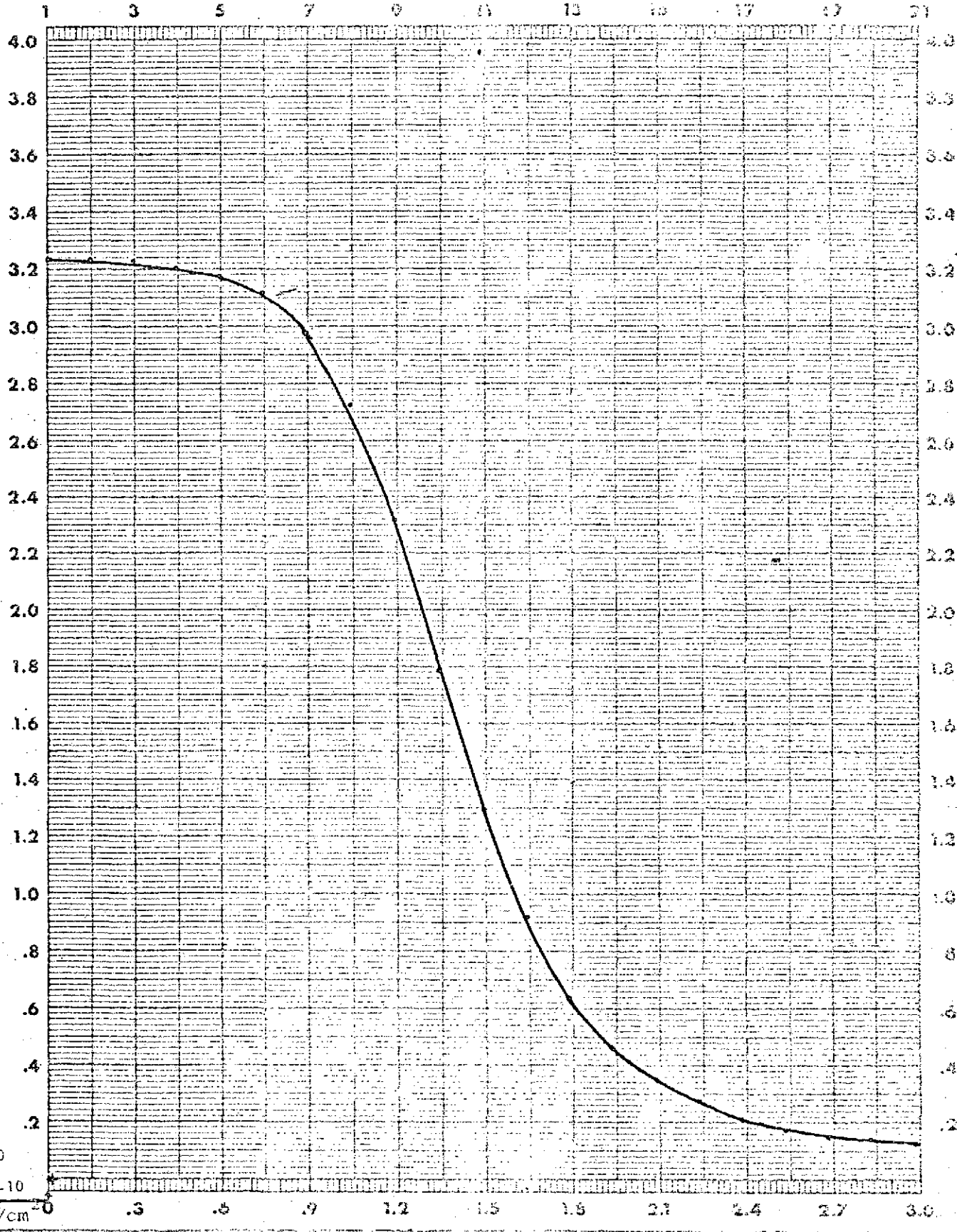
FILM 2443 EMULSION # 116-3 MFG \_\_\_\_\_ EXPIRATION DATE \_\_\_\_\_

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>EA 5</u>	TYPE	<u>TDS04</u>
TIME	<u>1/50</u> SEC.	SPEED	<u>7</u> FPS	APERTURE SIZE	<u>3</u>
FILTER	<u>5500</u>	TEMP °F	<u>110</u>	TEMP °F	<u>110</u>
				FILTER	<u>VISUAL</u>
					BASE # <u>100</u>

CHEMICAL ANALYSIS

- SP GR \_\_\_\_\_
- pH \_\_\_\_\_
- TA \_\_\_\_\_
- TRP \_\_\_\_\_
- KB<sub>r</sub> \_\_\_\_\_

21	
20	
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	

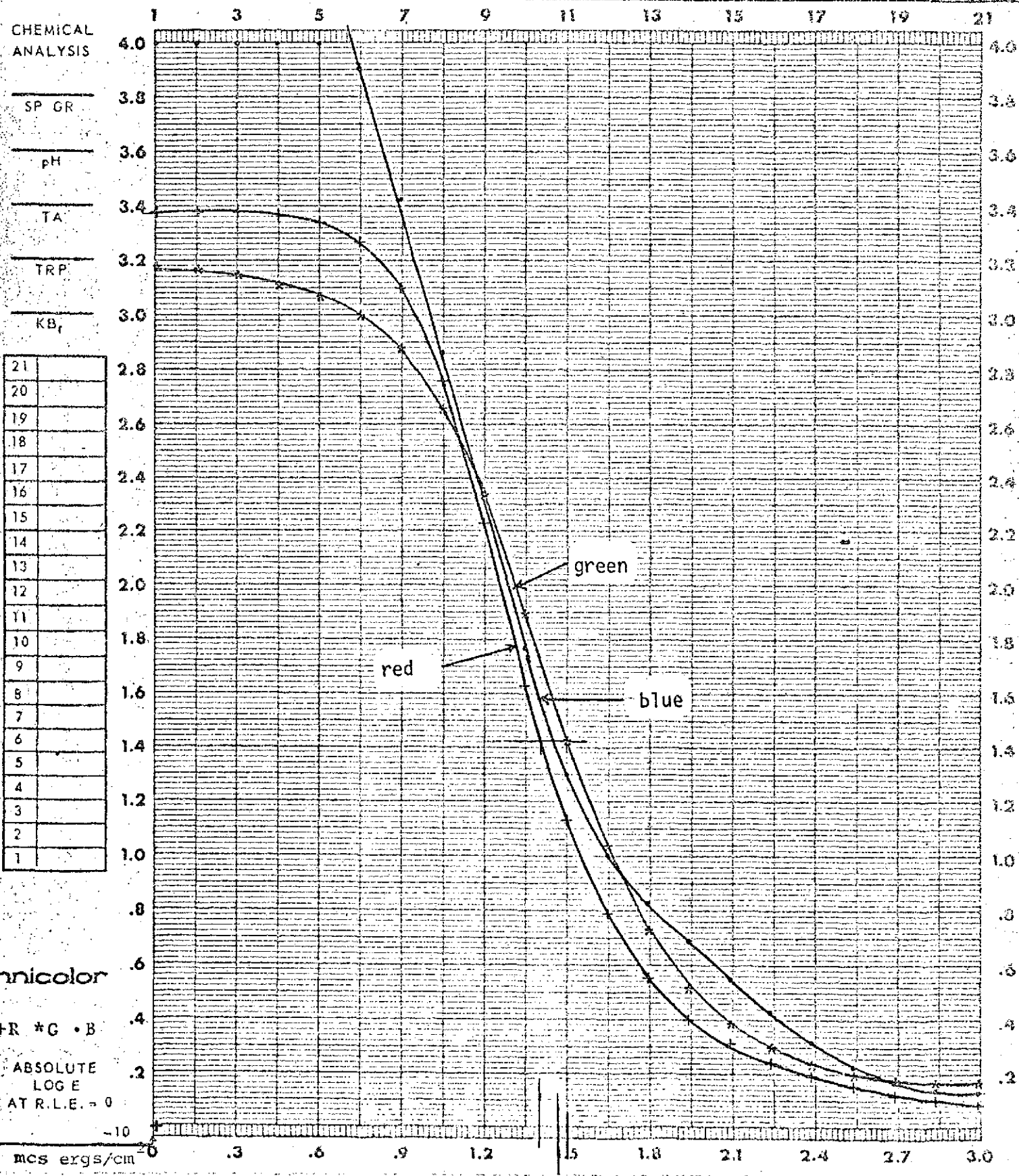


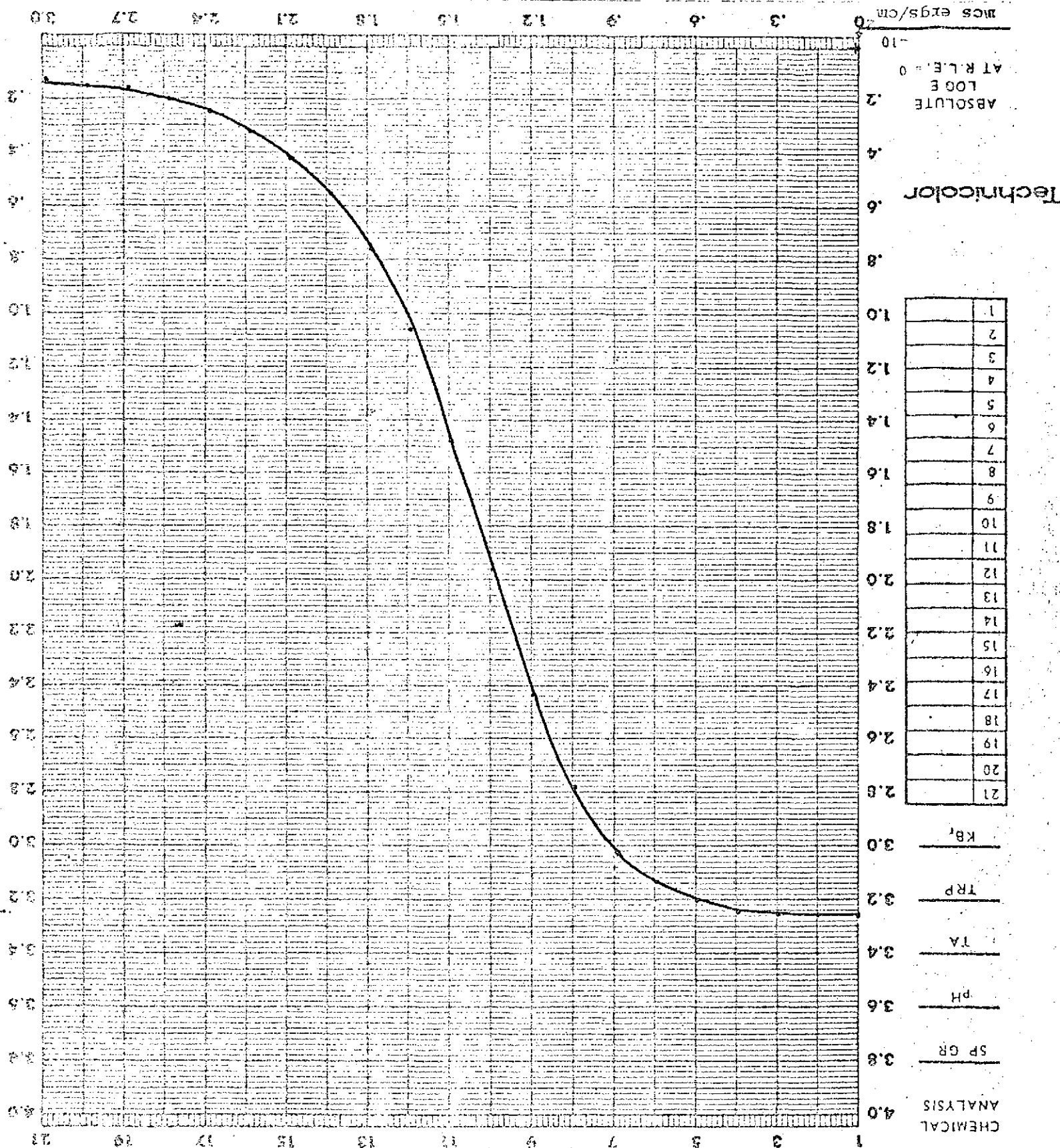
Technicolor

ABSOLUTE LOG E AT R.L.E. = 0

mcs ergs/cm<sup>2</sup>

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>EA-5</u>	TYPE	<u>TB504</u>
TIME	<u>1/50</u> SEC.	SPEED	TANKS <u>7</u> FPM	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5500</u>	TEMP °F	<u>110</u> TIME	FILTER	<u>STATUS A</u>
					SPEED ( )
					D-MAX
					GAMMA
					BASE FOG



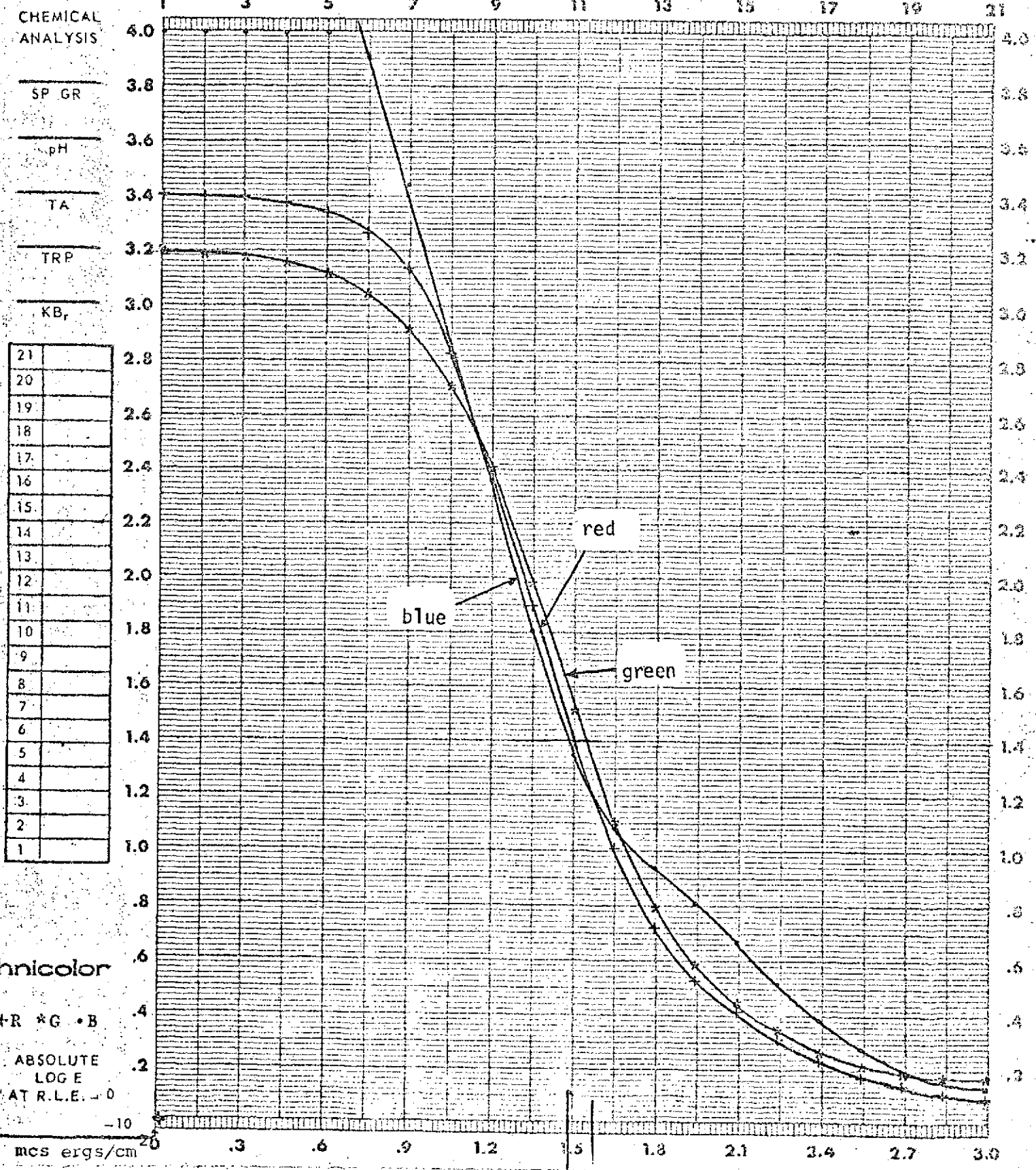


1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	

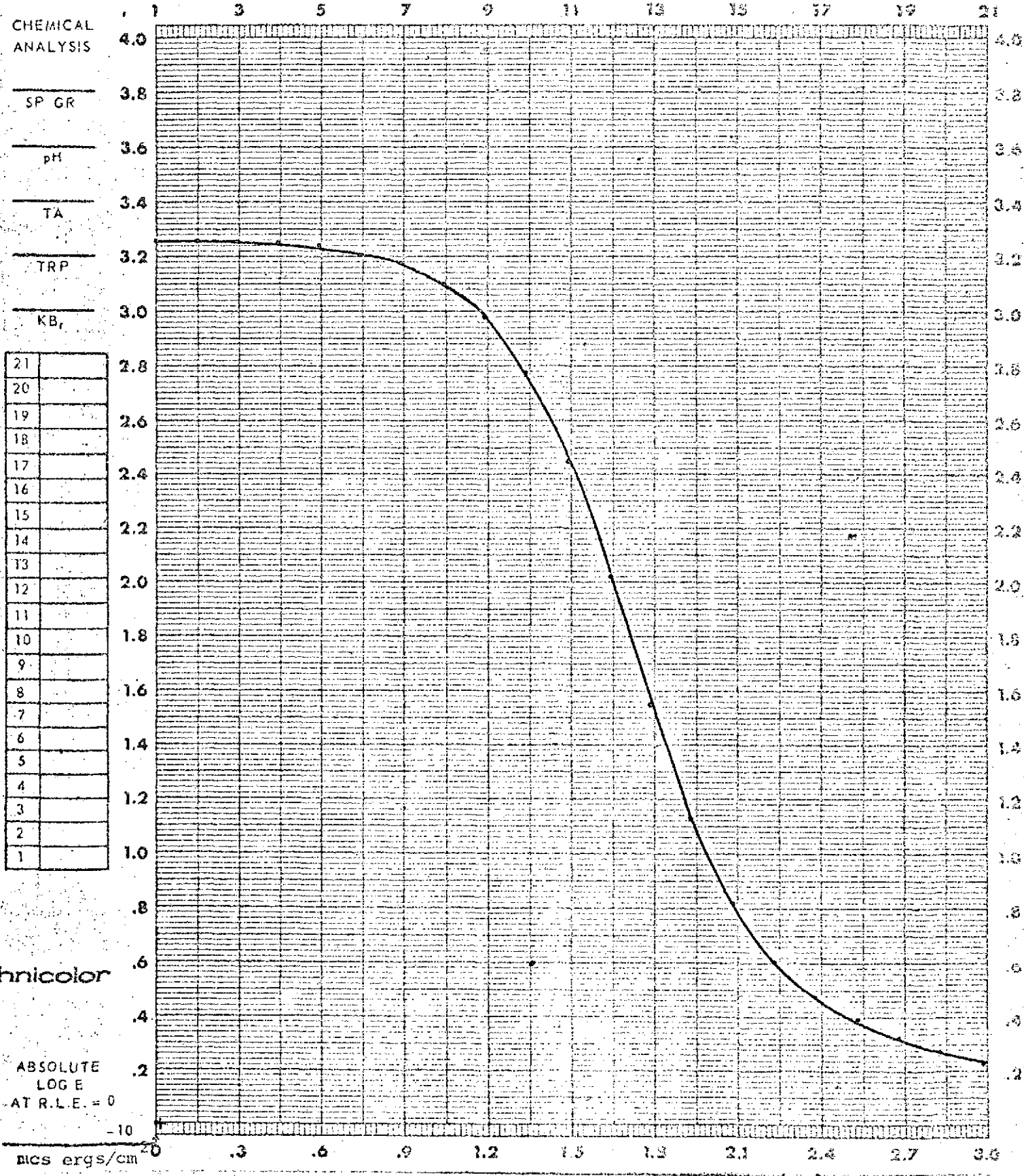
EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSOR METER	I-B	PROCESSOR	18H	INSTRUMENT	MacBeth
ILLUMINANT	2850°K	CHEMISTRY	EA-5	TYPE	T050F
TIME	1/50 sec.	SPEED	7	APERTURE SIZE	5
FILTER	S500	TEMP OF FILM	110	FILTER	VISUAL
BASE + POS		DAMA		D-MAX	

FILM 2443 EMULSION # 116-3 MFG  
 DATE 5-18-74 CONTROL # TASK PREPARED BY  
 EXPIRATION DATE

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>J-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2750 °K</u>	CHEMISTRY	<u>EA-5</u>	TYPE	<u>TD504</u>
TIME	<u>1/50 SEC.</u>	SPEED	<u>7</u> TANKS <u>FPM</u>	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5500</u>	TEMP °F	<u>110</u> TIME	FILTER	<u>STATUS A</u>
					SPEED ( )
					D-MAX
					GAMMA
					BASE + FOG



EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>EA-5</u>	TYPE	<u>TDS04</u>
TIME	<u>1/50</u> SEC.	SPEED	TANKS <u>7</u> FPM	APERTURE SIZE	<u>3</u> MIN
FILTER	<u>SS00+W12</u>	TEMP °F	<u>110</u> TIME	FILTER	<u>VISUAL</u>
					BASE + FOG



21	
20	
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	

CHEMICAL ANALYSIS

SP GR

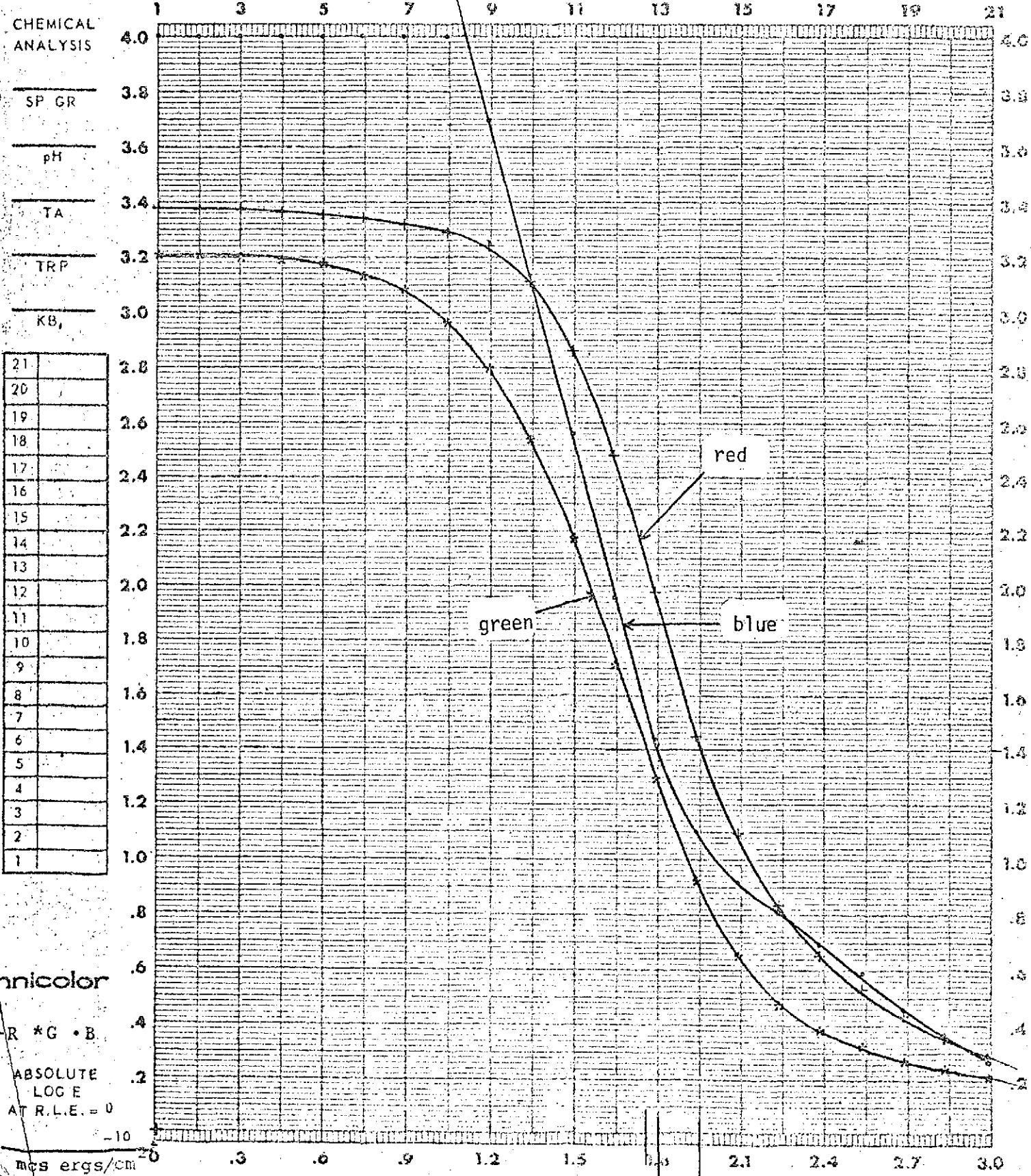
pH

TA

TRP

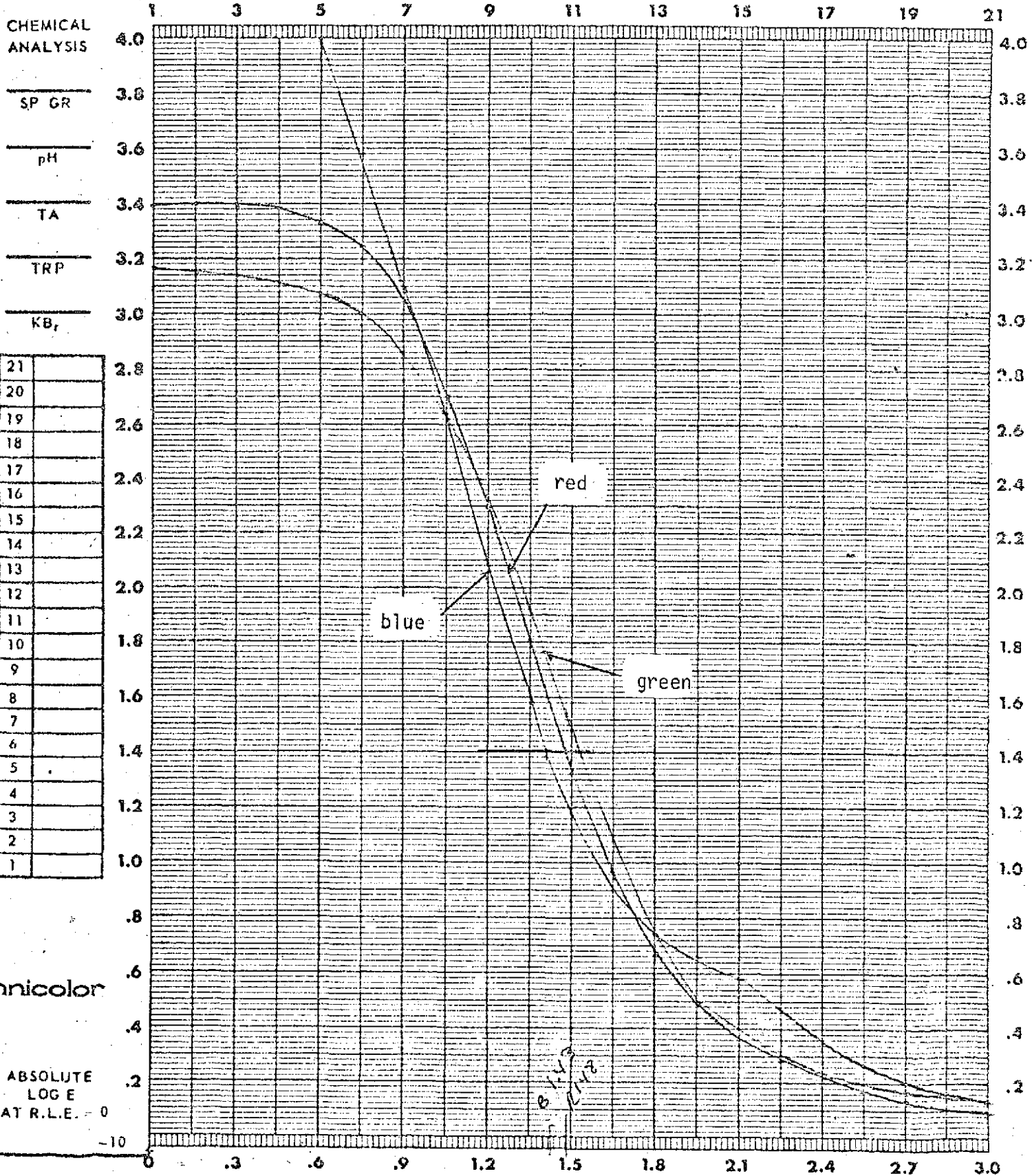
KB<sub>1</sub>

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>Macbeth</u>
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>EA-5</u>	TYPE	<u>T0504</u>
TIME	<u>1/50 SEC.</u>	SPEED	TANKS <u>7</u> FPM	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5500+W12</u>	TEMP °F	<u>110</u> TIME _____	FILTER	<u>STATUS A</u>
					SPEED ( )
					D-MAX
					GAMMA
					BASE + FOG





EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>EA-5</u>	TYPE	<u>TDS04</u>
TIME	<u>1/50</u> SEC.	SPEED	TANKS <u>7</u> FPM	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5500</u>	TEMP °F	<u>110</u> TIME	FILTER	<u>STATUS 1</u>
				SPEED ( )	
				D-MAX	
				GAMMA	
				BASE + FOG	



- CHEMICAL ANALYSIS
- SP GR \_\_\_\_\_
  - pH \_\_\_\_\_
  - TA \_\_\_\_\_
  - TRP \_\_\_\_\_
  - KB<sub>r</sub> \_\_\_\_\_

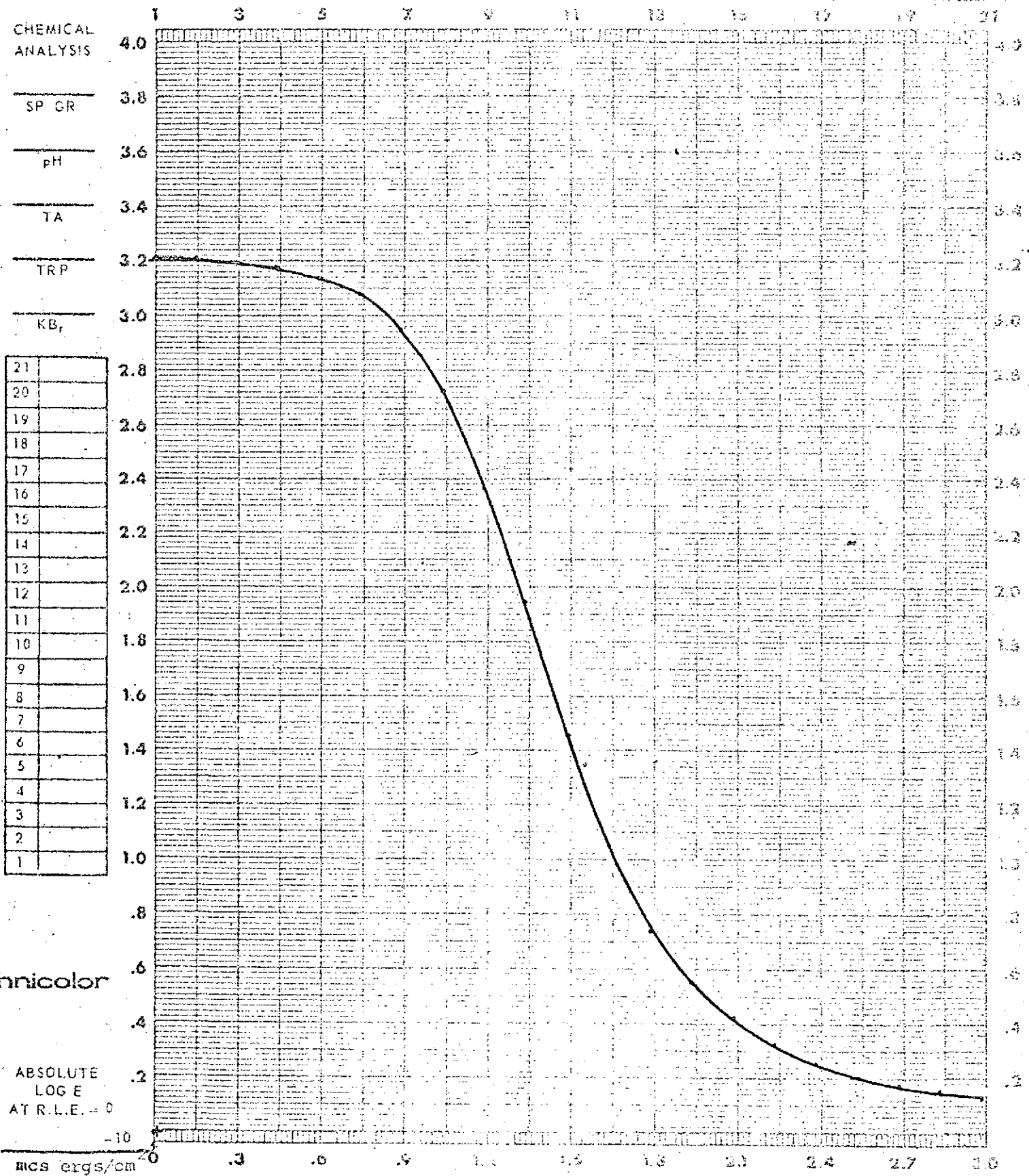
21	
20	
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	

Technicolor

ABSOLUTE LOG E AT R.L.E. = 0

-10

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850</u> °K	CHEMISTRY	<u>EA-5</u>	TYPE	<u>D504</u>
TIME	<u>1/50</u> SEC.	SPEED	<u>7</u> FPM	APERTURE SIZE	<u>3</u>
FILTER	<u>5500</u>	TEMP °F	<u>110</u>	FILTER	<u>VISUAL</u>



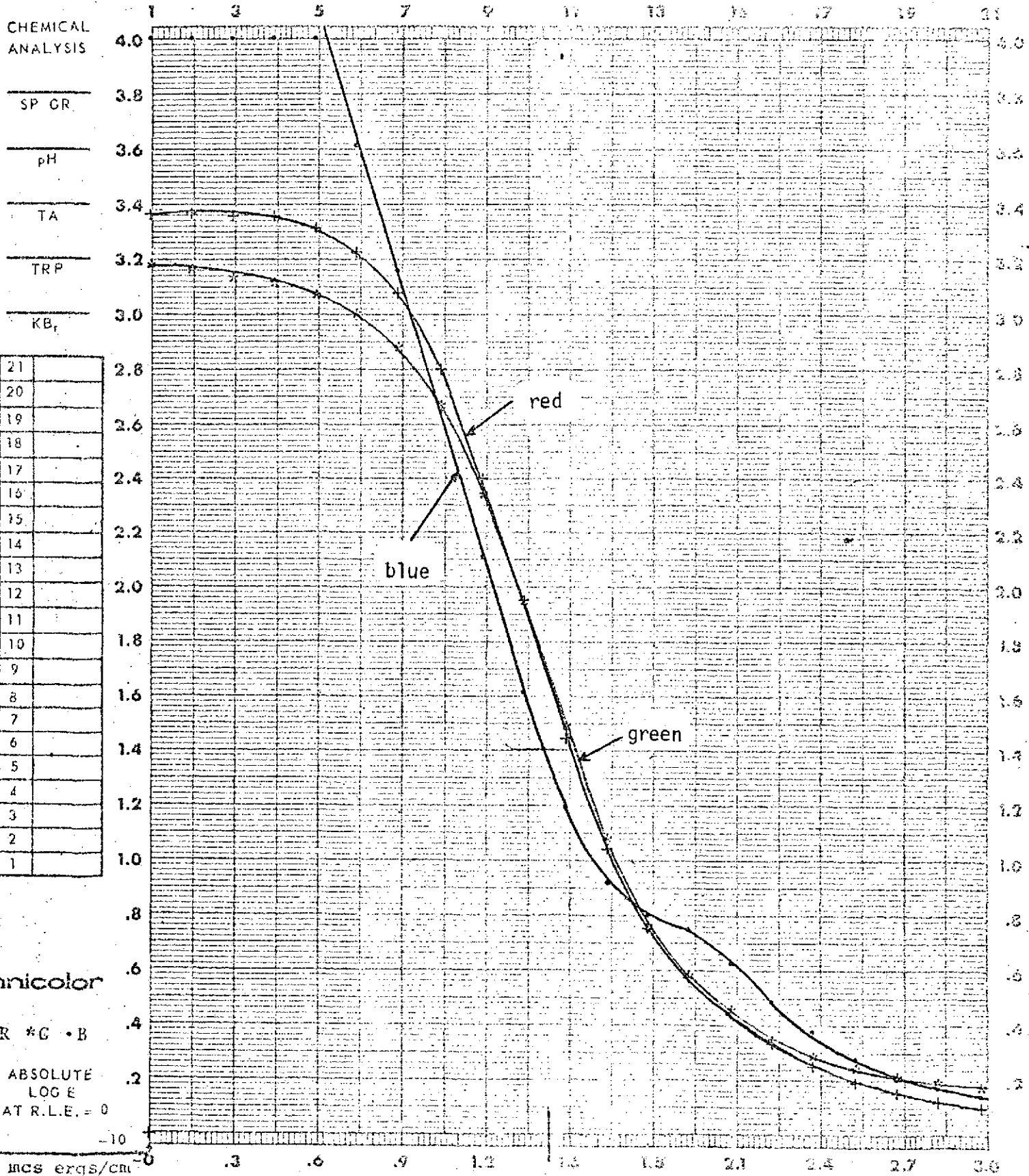
21	
20	
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	

Technicolor

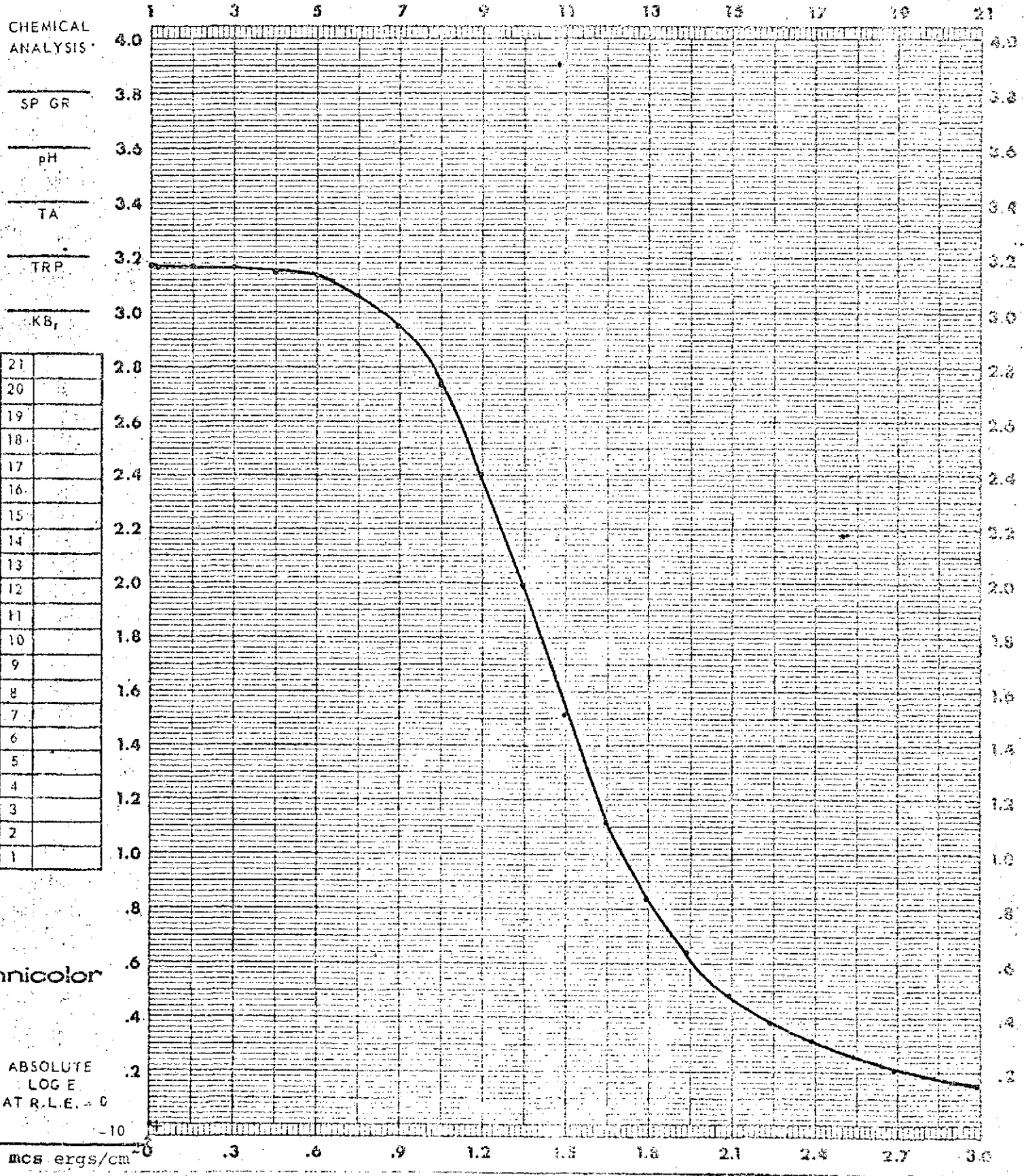
ABSOLUTE LOG E  
AT R.L.E. = 0

mcs ergs/cm²

EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850</u> K	CHEMISTRY	<u>EA-5</u>	TIME	<u>T.D. 504</u>
TIME	<u>1/50</u> SEC.	SPEED	<u>TAR 7</u>	APERTURE	<u>NO. 3</u>
FILTER	<u>5500</u>	TEMP °F	<u>110</u>	ENTER	<u>STATUS A</u>



EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2250 °K</u>	CHEMISTRY	<u>EA-5</u>	TYPE	<u>10504</u>
TIME	<u>150</u> SEC.	SPEED	<u>7</u> TANKS	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5500</u>	TEMP °F	<u>110</u> TIME	FILTER	<u>VISUAL</u>
					SPEED ( )
					D-MAX
					GAMMA
					BASE + FOG

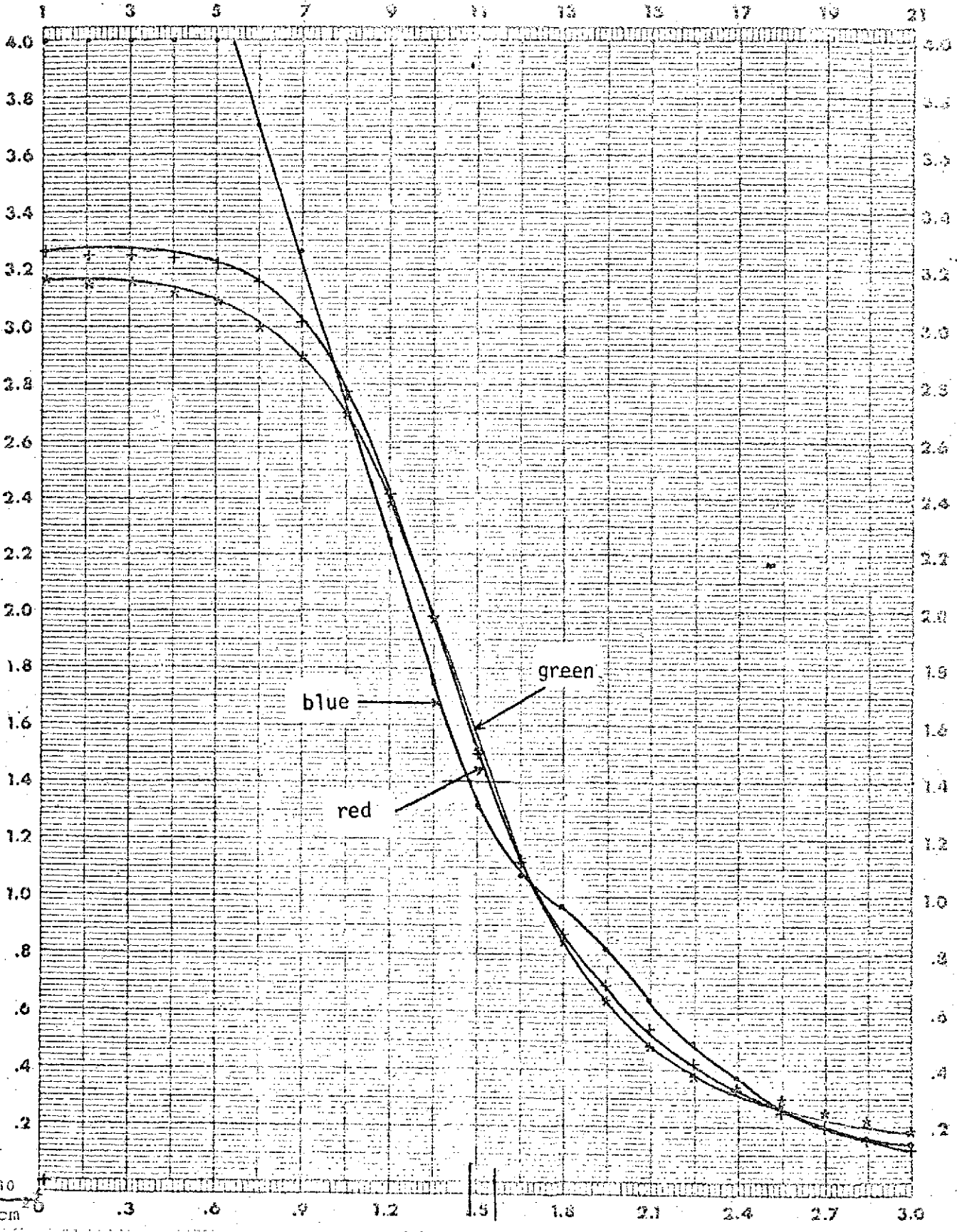


EXPOSURE DATA		PROCESSING DATA		DENSITOMETRY	
SENSITOMETER	<u>I-B</u>	PROCESSOR	<u>1811</u>	INSTRUMENT	<u>MacBeth</u>
ILLUMINANT	<u>2850 °K</u>	CHEMISTRY	<u>EAS</u>	TYPE	<u>TDS04</u>
TIME	<u>1/50</u> SEC.	SPEED	<u>TANAS 7</u> FPM	APERTURE SIZE	<u>3</u> MM
FILTER	<u>5600</u>	TEMP °F	<u>110</u> TIME	FILTER	<u>STATUS A</u>
					SPEED
					D-MAX
					GAMMA
					BASE + FOG

CHEMICAL ANALYSIS

- SP GR \_\_\_\_\_
- pH \_\_\_\_\_
- TA \_\_\_\_\_
- TRP \_\_\_\_\_
- KB<sub>r</sub> \_\_\_\_\_

21	
20	
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	



Technicolor

+R \*G \*B

ABSOLUTE LOG E  
AT R.L.E. = 0

mcs ergs/cm²