

**TEXAS INSTRUMENTS, INC.'S**

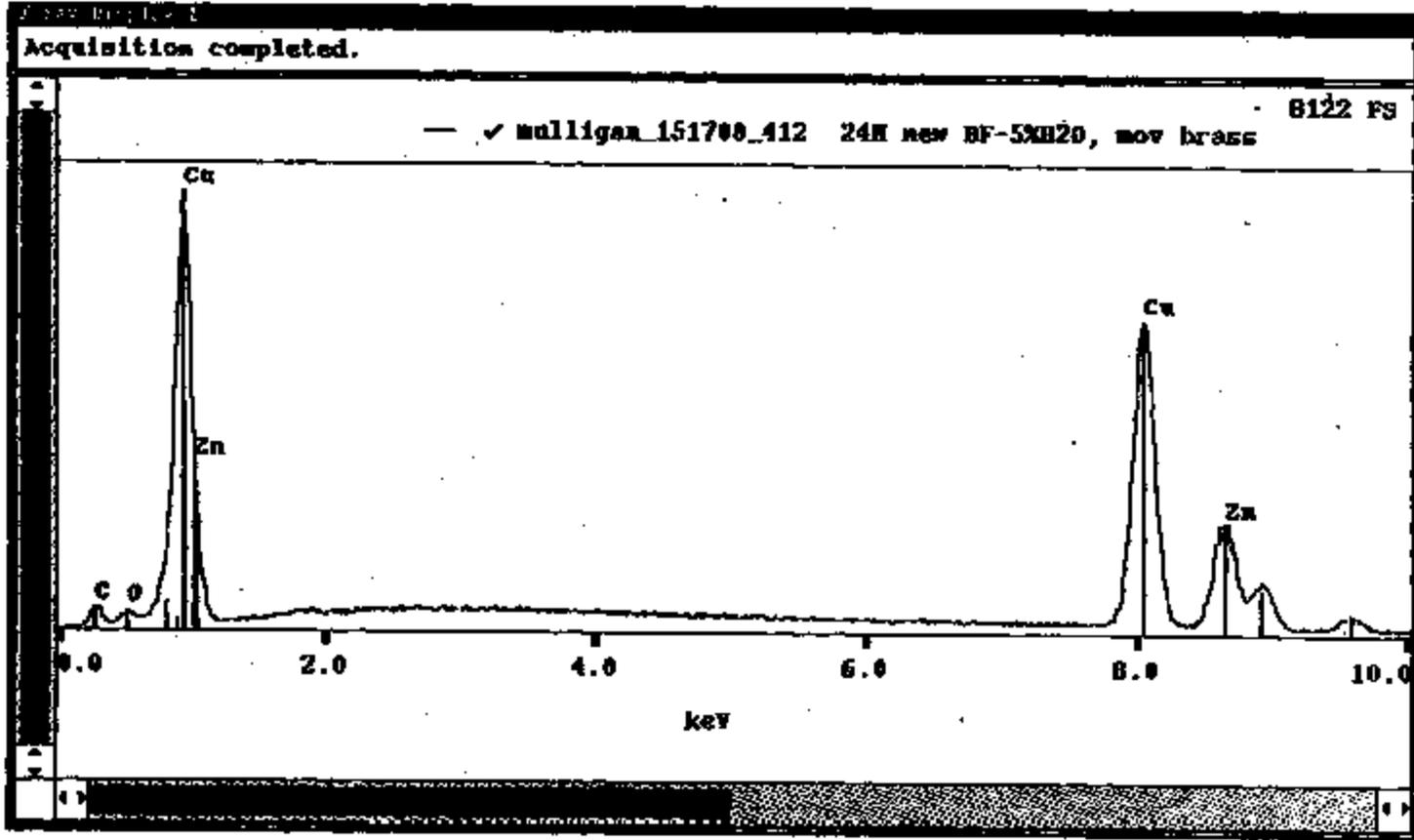
**09/10/03**

**REQUEST 6**

**BOX 7**

**PART A-P**

**PART C**

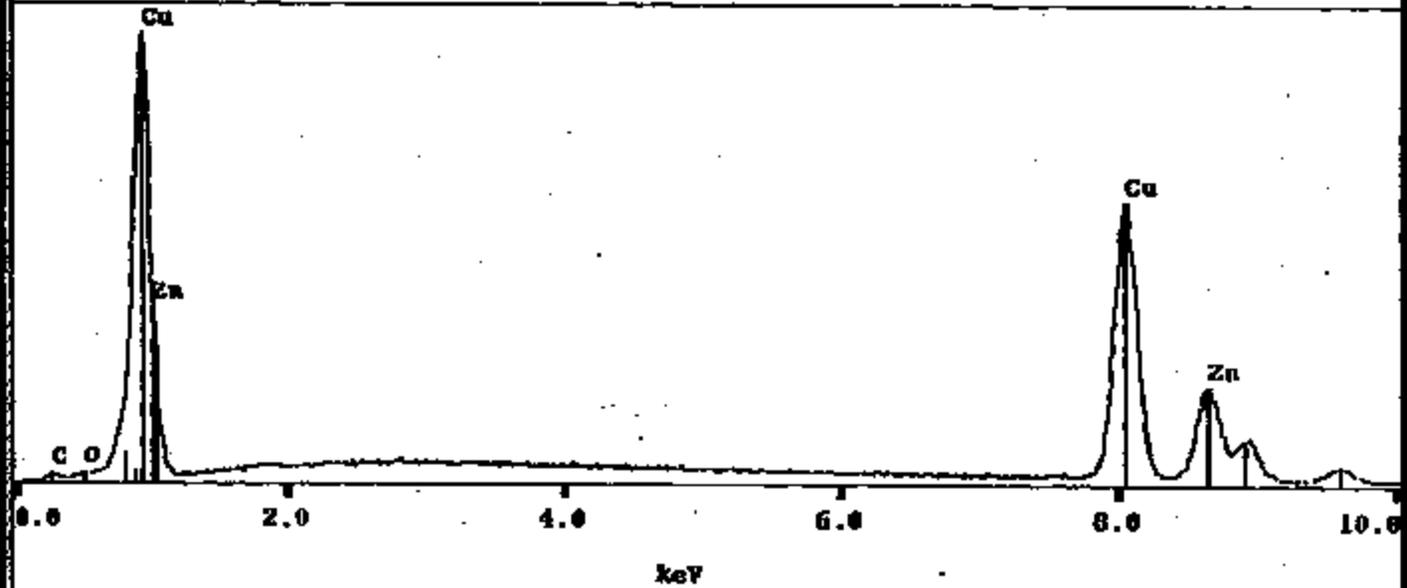


TI-NHTSA 9773

Acquisition completed.

9001 FS

✓ milligan\_151700\_413 24K new BF-53H20, nov brass

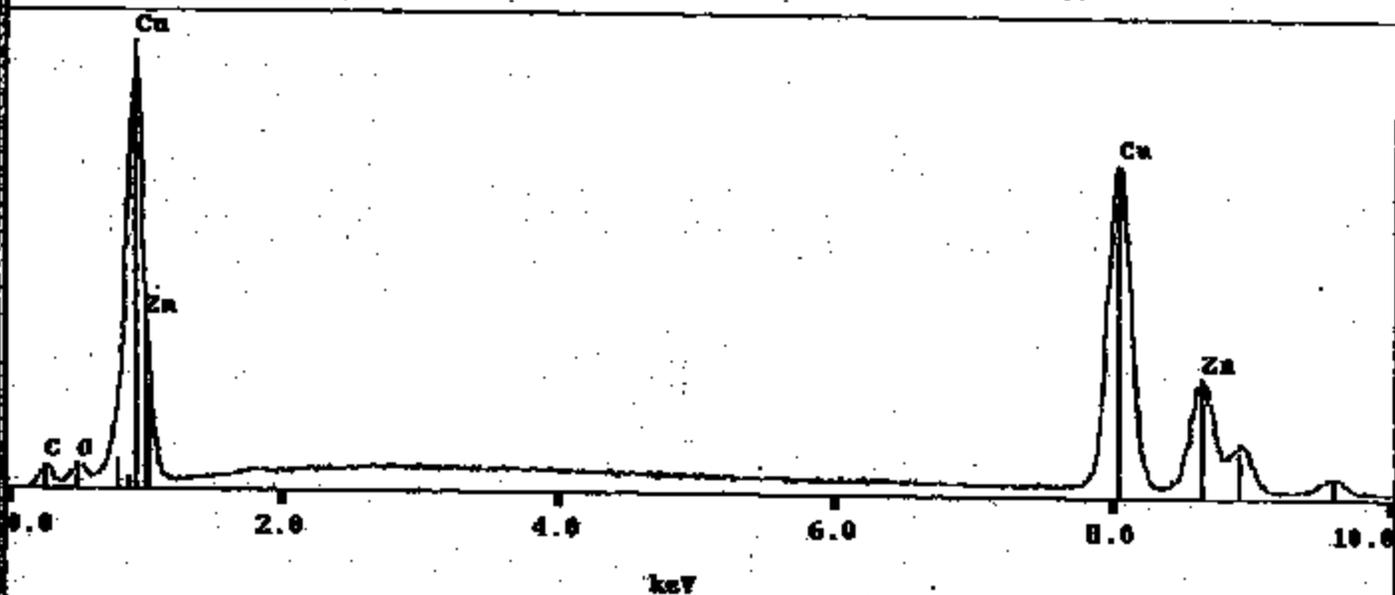


TI-NHTSA 9774

Acquisition completed.

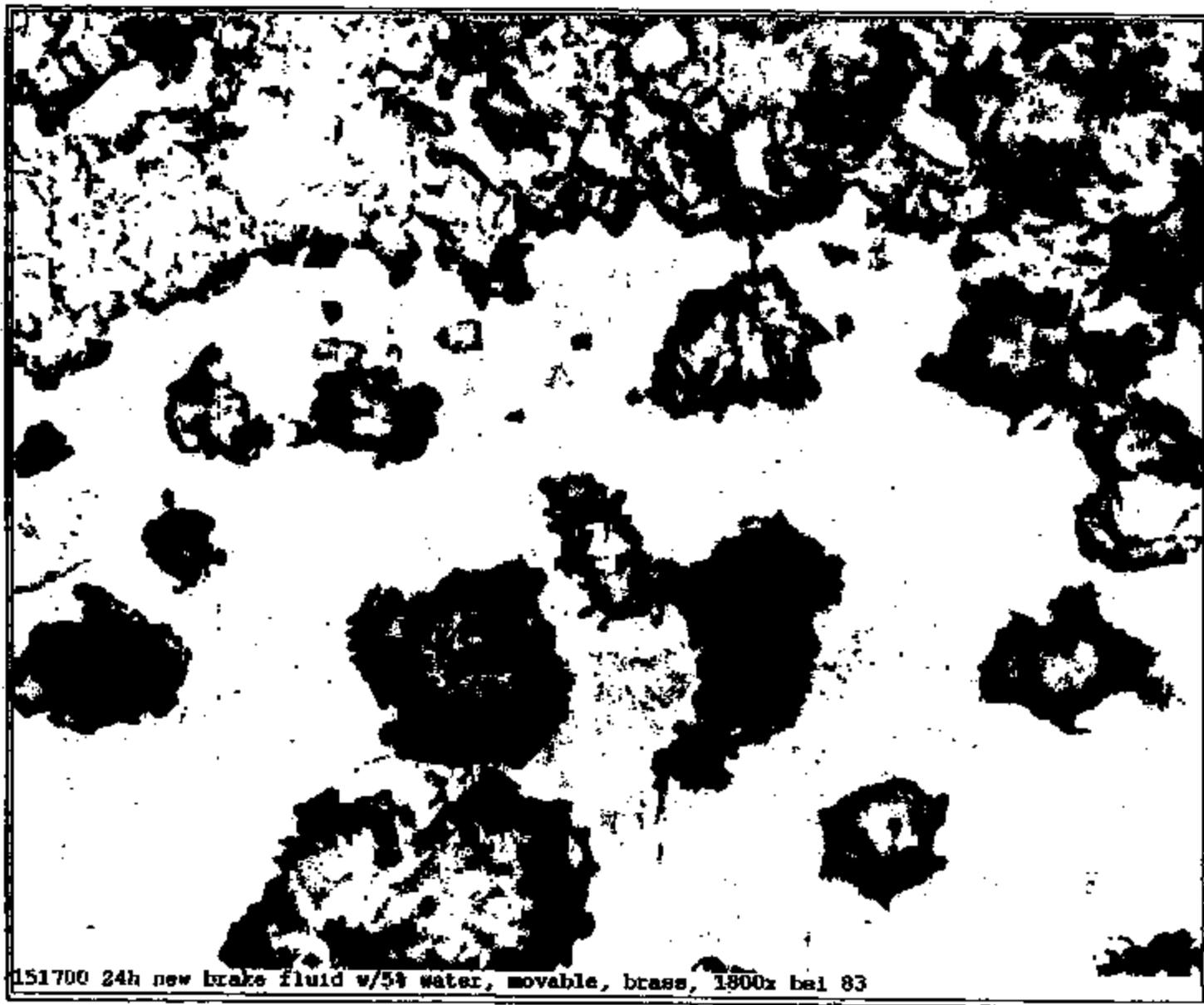
✓ mulligan\_151700\_414 24R new BF-5XE20, mov brass

8367 FS



TI-NITSA 9775

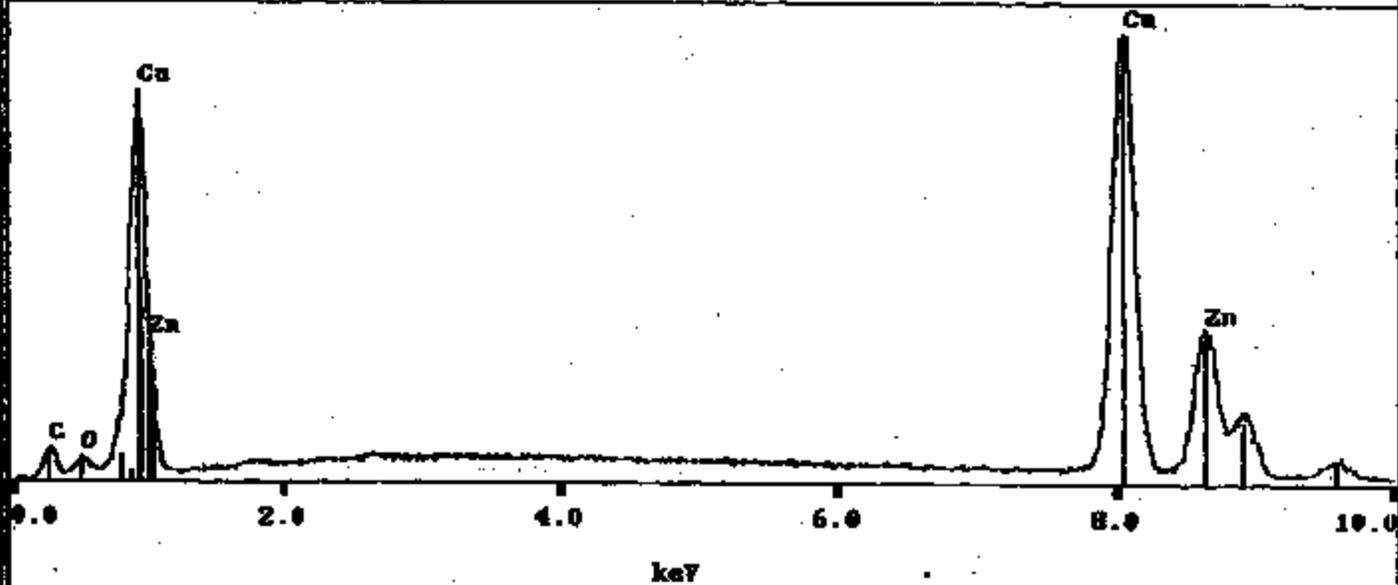
TI-NHTSA 9776



151700 24h new brake fluid w/5% water, movable, brass, 1800x bal 83

Acquisition completed.

✓ nulligan\_151700\_415 24H new RF-53220, new brass 5632 FS



TI-NHTSA 9777

TAT-244 NSW B.F. 5% Mo - Cleared in PA





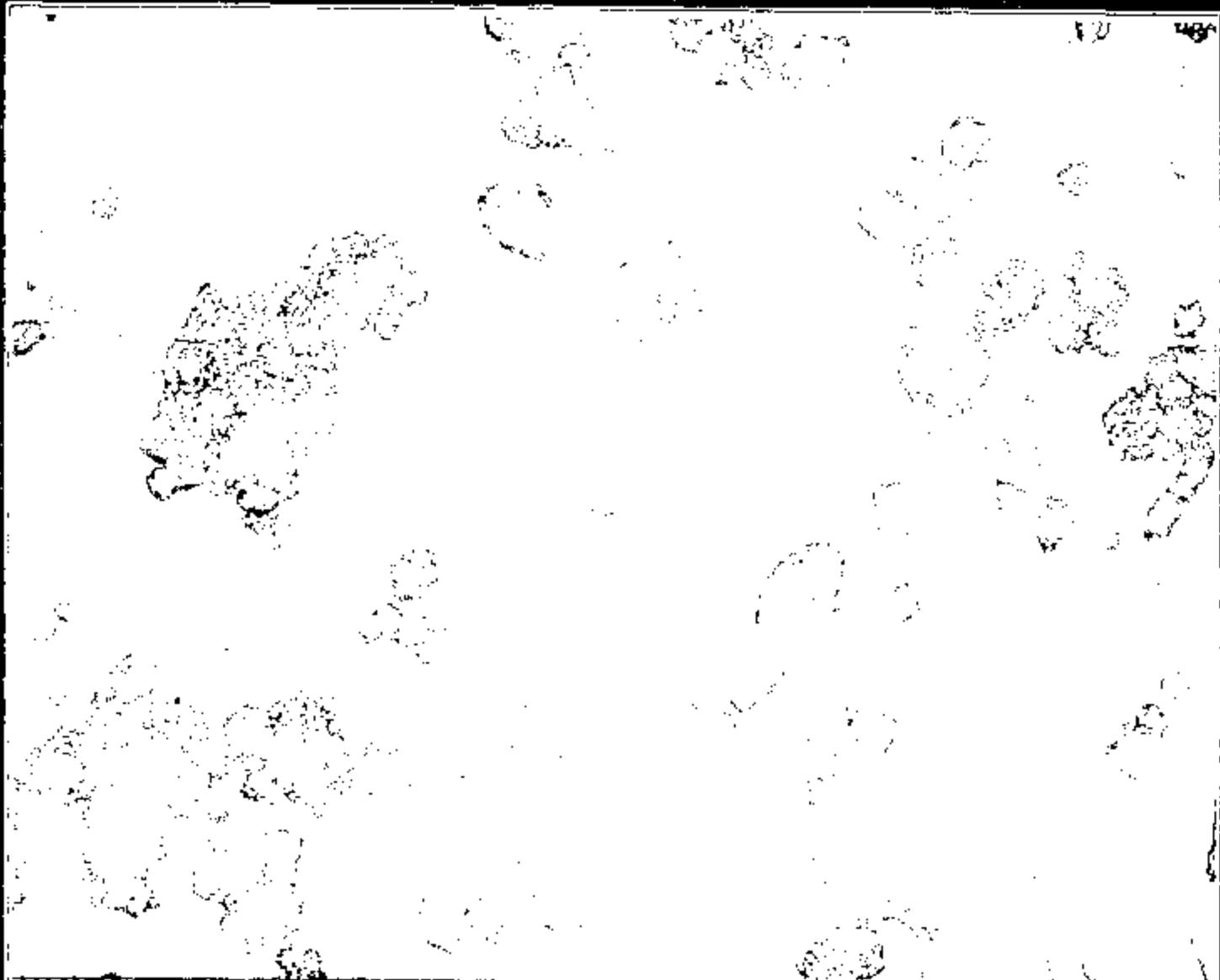
151700 24h new brake fluid w/5% water, stationary, brass, 200x bel 86

TI-NHTSA 9779

71-NHTSA 9780



151700 24h new brake fluid w/50 water, stationary, brass, 25x sei 84



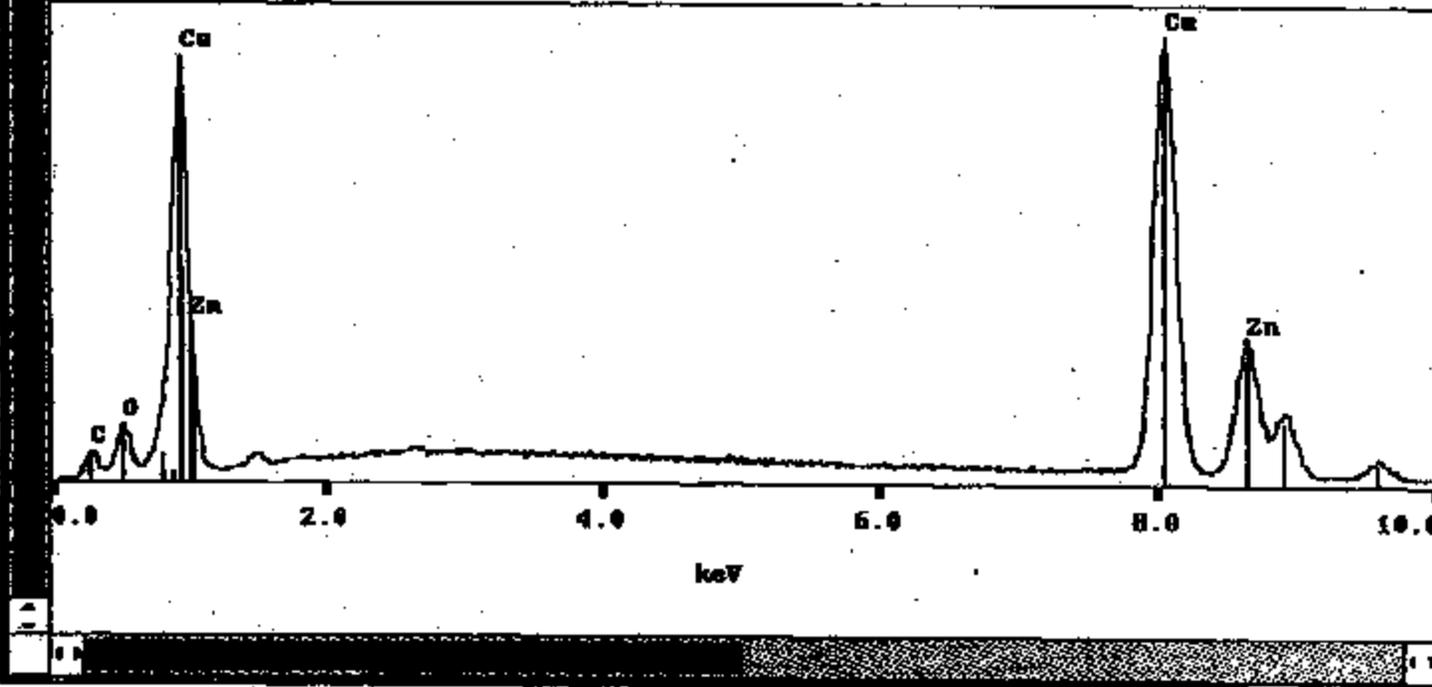
151700 24h new brake fluid w/5% water, stationary, brass, 200x sei 85

TI-NHTSA 8781

Acquisition completed.

— ✓ mulligan\_151700\_416 24H new BF-5020, stat brass

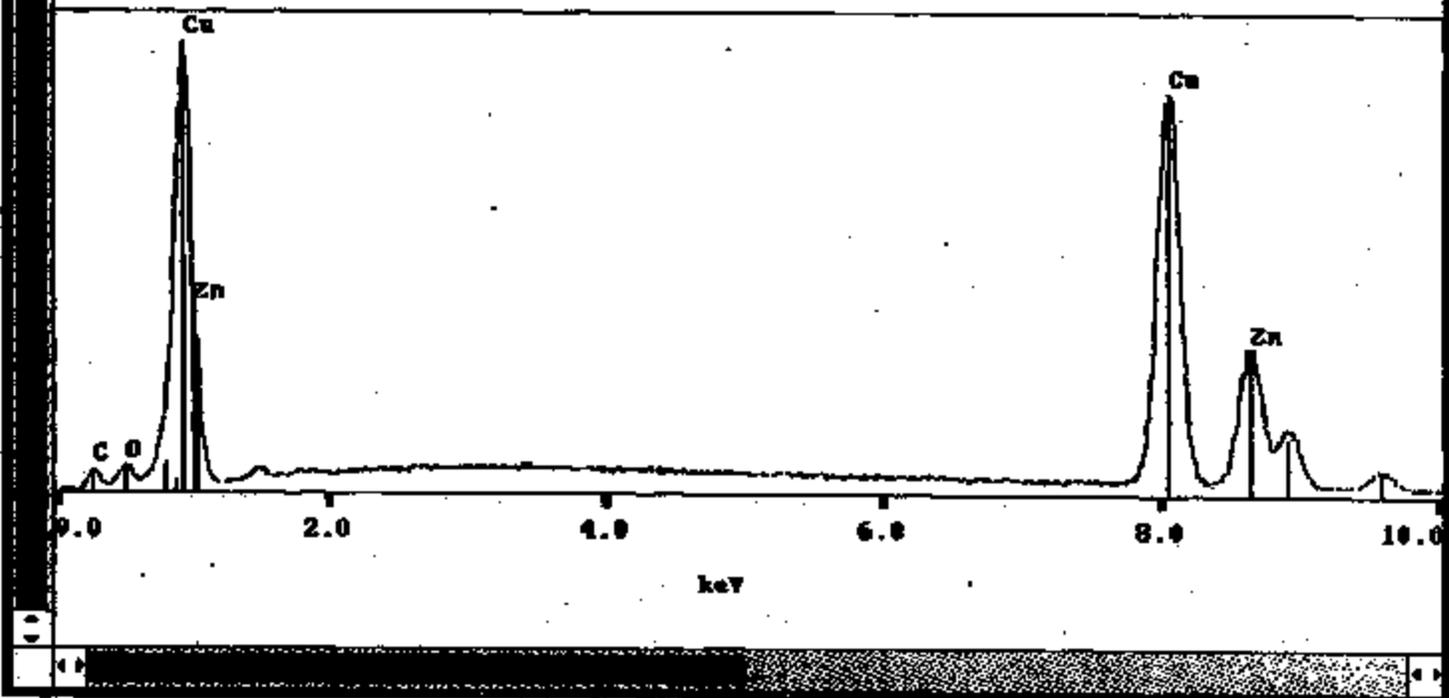
6397 FS



TIANTSA 9762

Acquisition completed.

— ✓ mulligan\_151700\_417 24H new BF-5MH20, stat brass 6974 FS

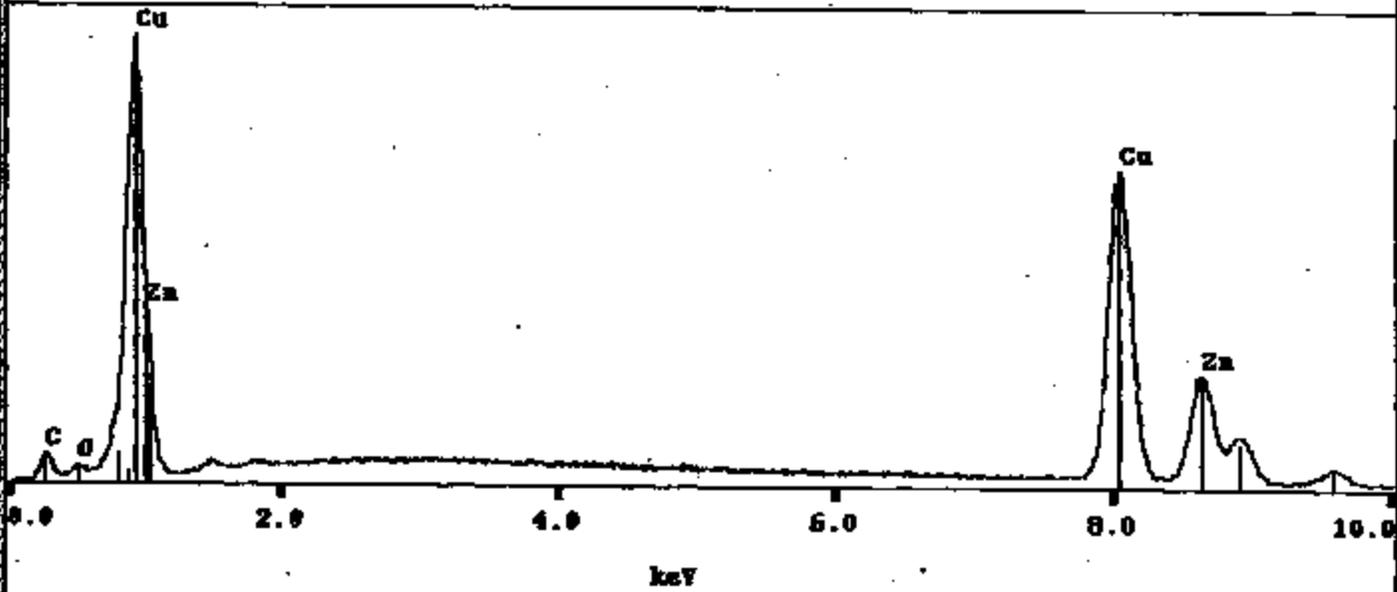


TI-NHTSA 9789

Acquisition completed.

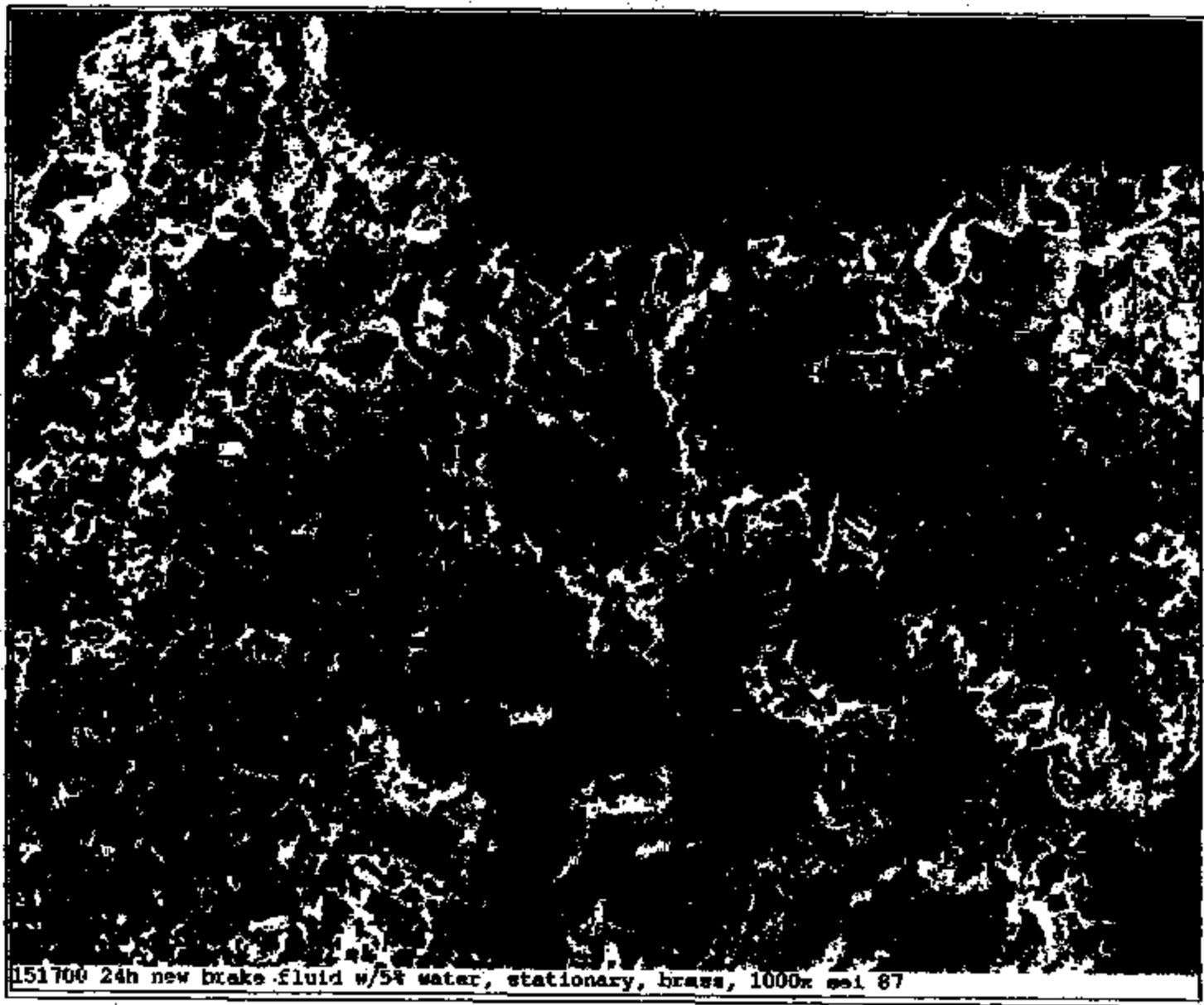
— ✓ mulligan\_151700\_41B 24H new BF-53E20, stat brass

8142 FS



TI-NHTSA 9784

TI-NHTSA 9785

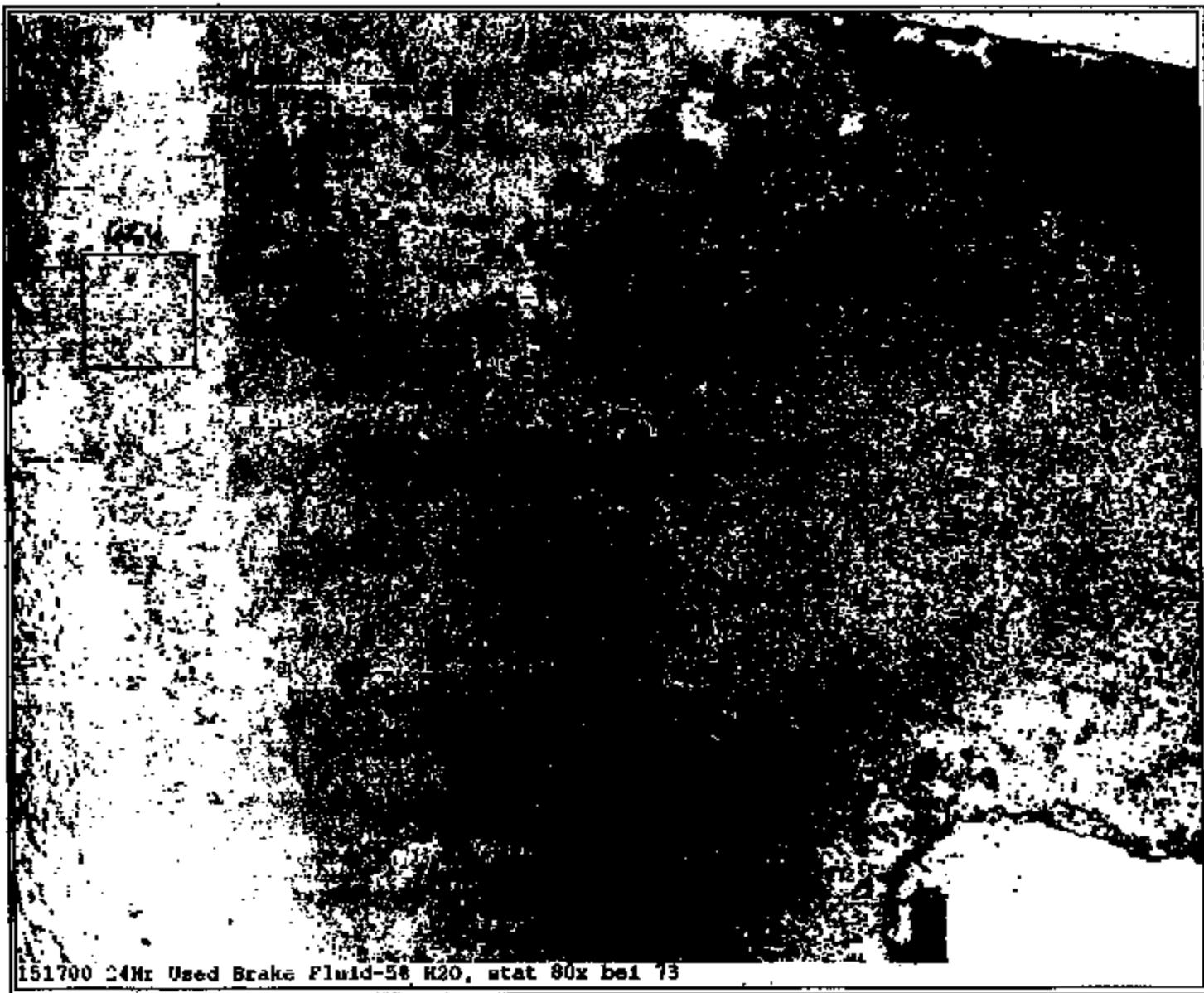


151700 24h new brake fluid w/5% water, stationary, brass, 1000x esi 87

751700  
29th USE/ST/20  
STAT



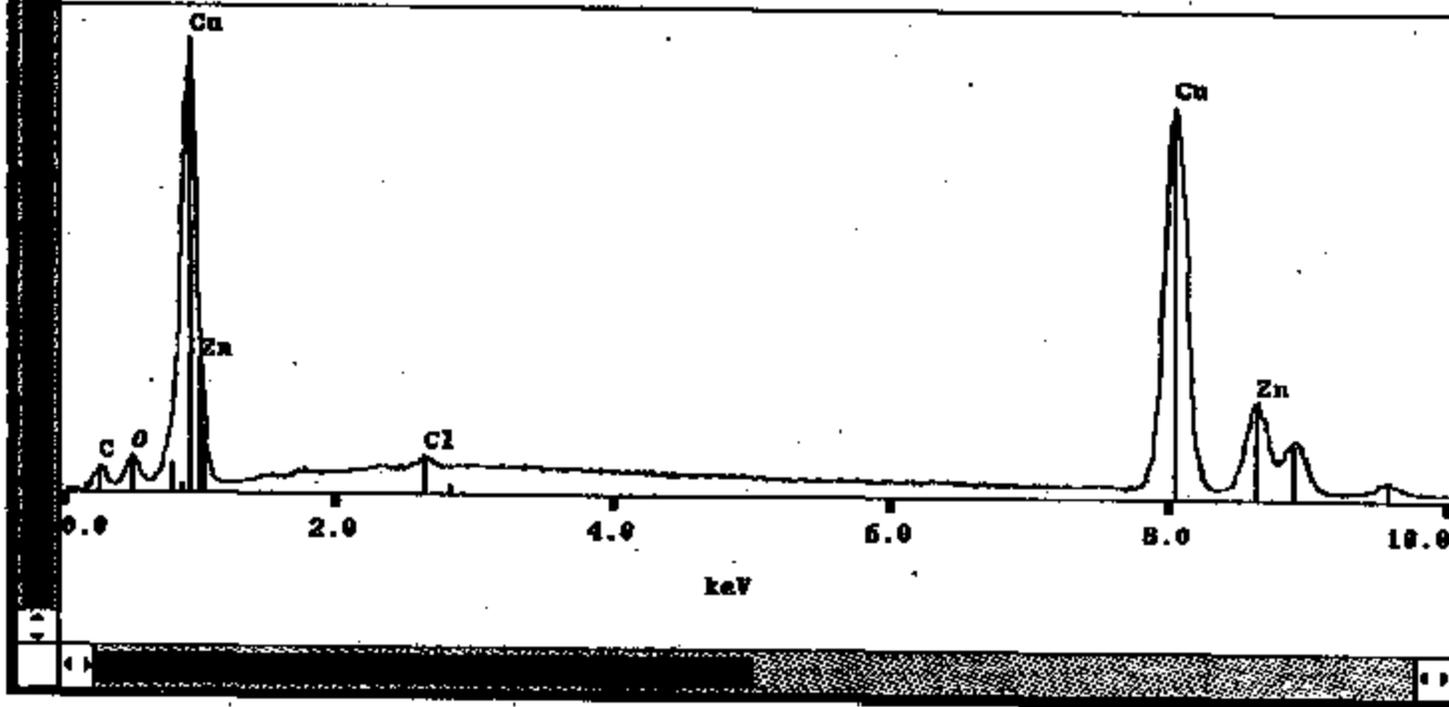
TI-NHTSA 9787



Acquisition completed.

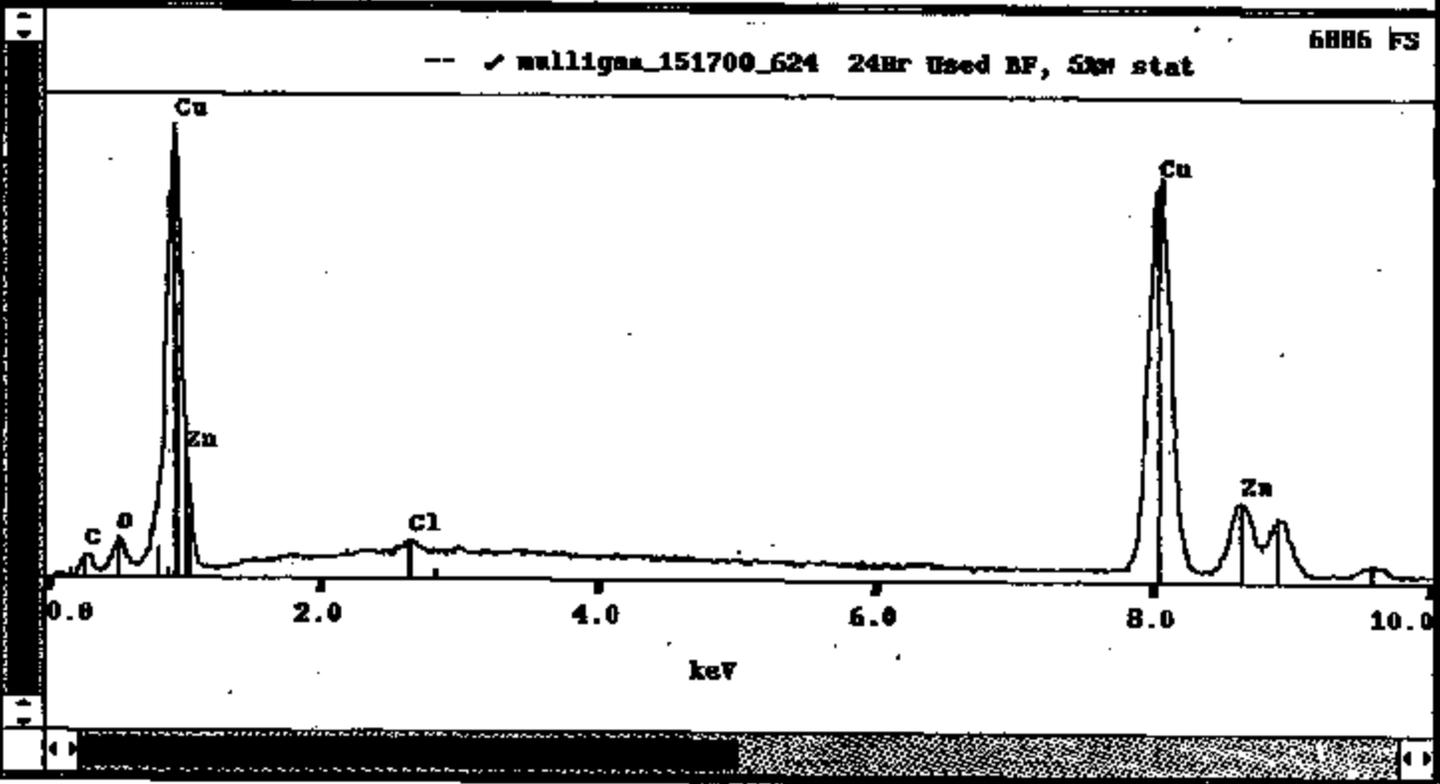
✓ nulligan\_151700\_623 24Hr Used BF, 50W stat

10991 FS



TI-NHTSA 8788

Acquisition completed.

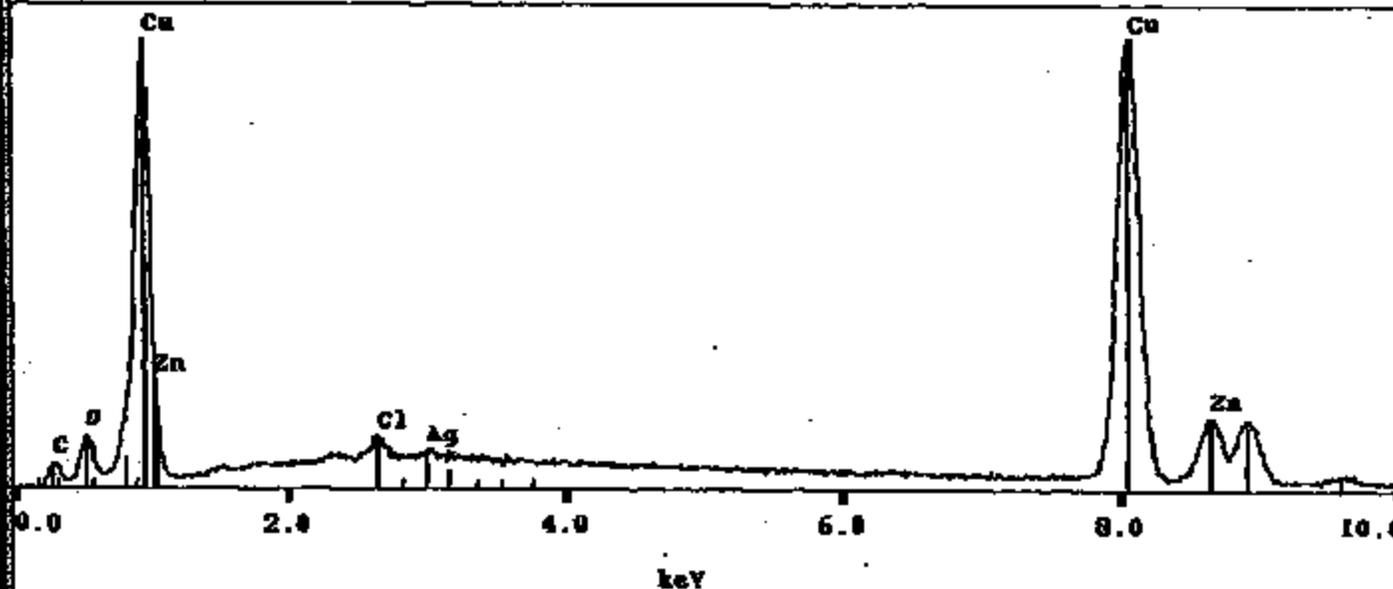


TI-NHTSA 9780

Acquisition completed.

✓ walligan\_151700\_625 24Hr Used BF, 50W stat

5274 FS

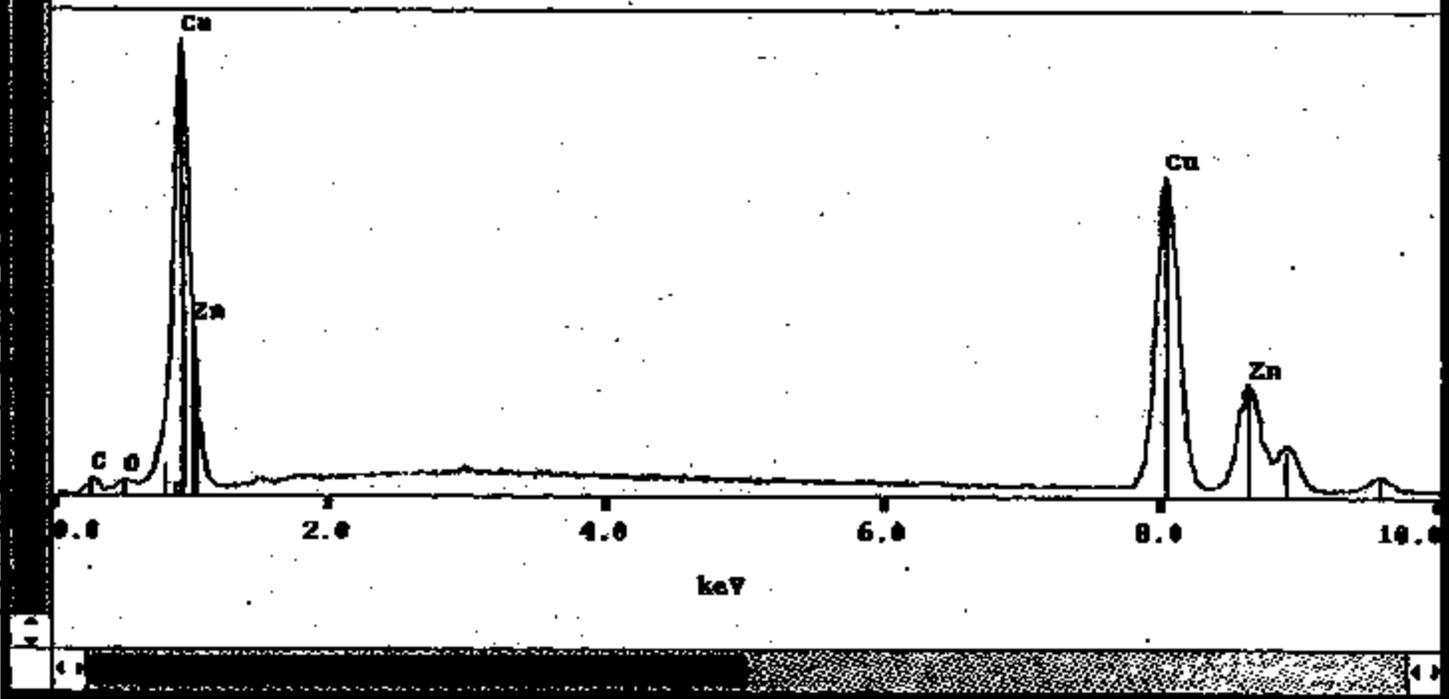


TI-NHTSA 9790

Acquisition completed.

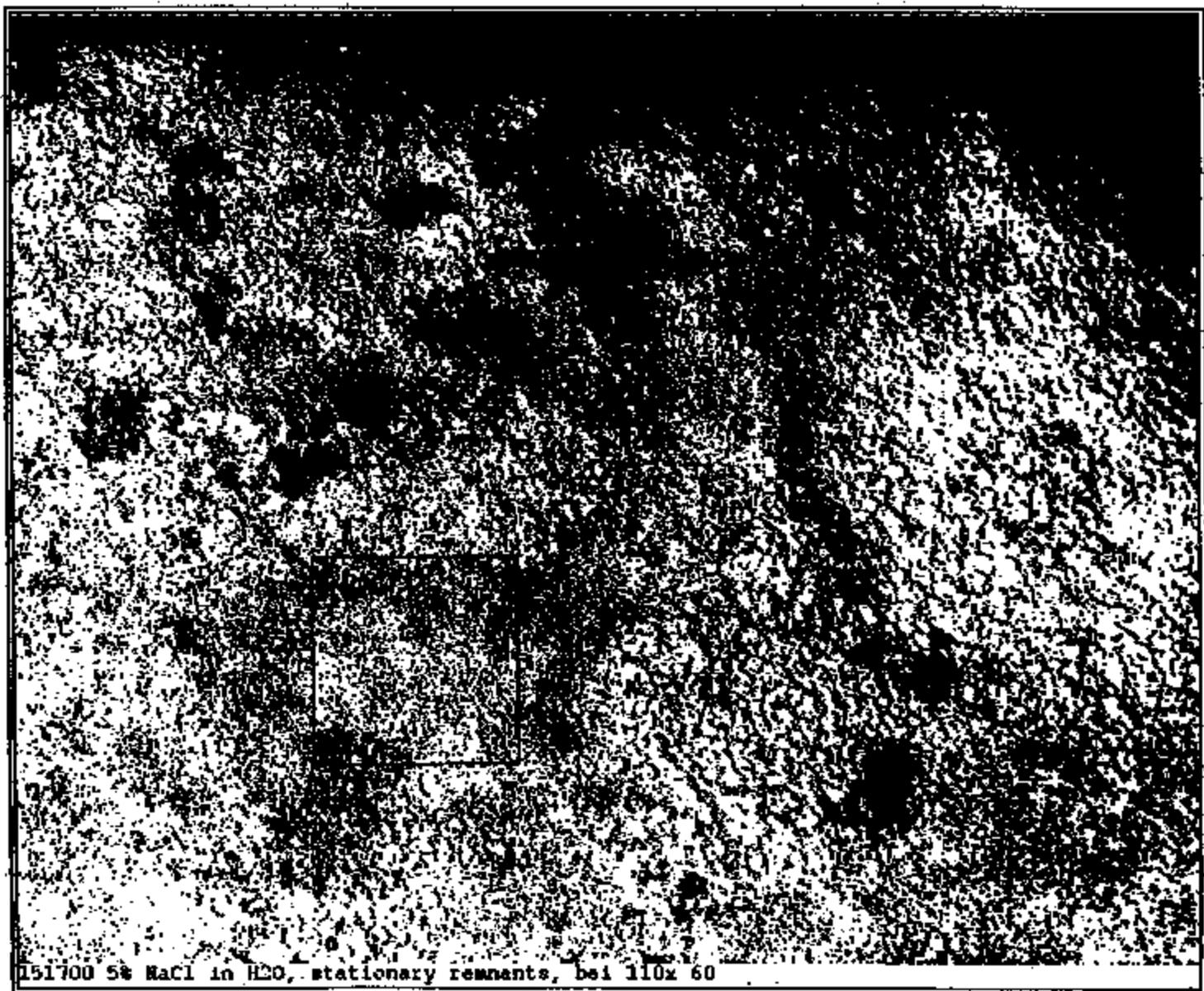
9317 #9

✓ mulligan\_151700\_626 24Hr Hood BF, 53W stat



TI-NHTSA 8791

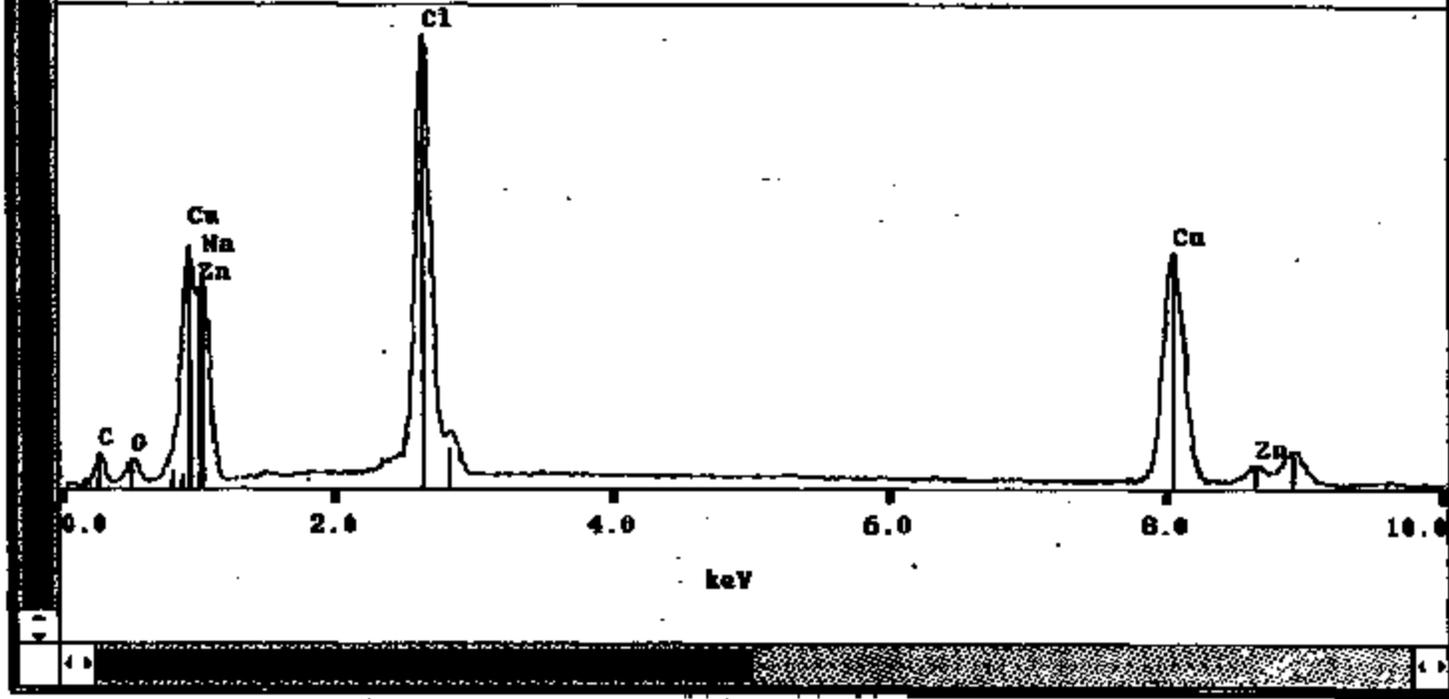
TI-NHTSA 9792



151700 5% NaCl in H<sub>2</sub>O, stationary remnants, bei 110x 60

Acquisition completed.

✓ mulligan\_151700\_600 5% NaCl in H2O stat remnants 8679 FS

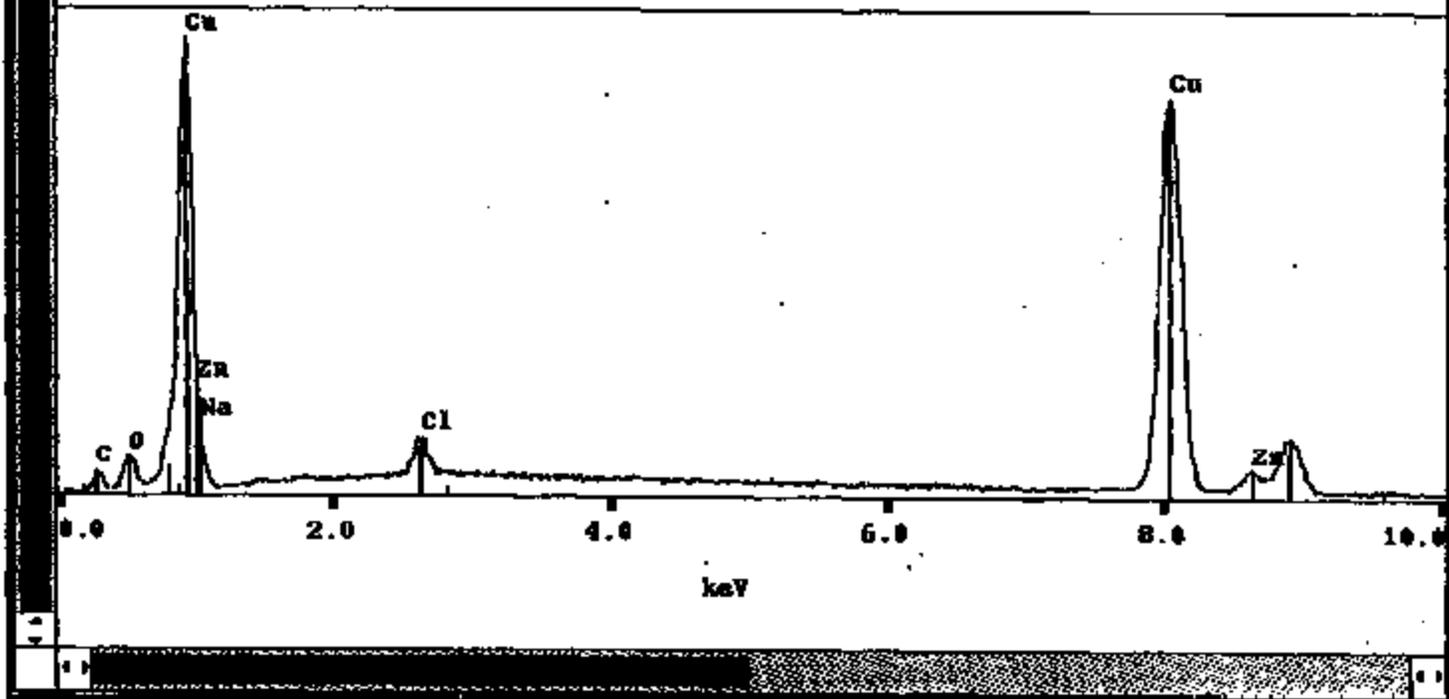


TI-NHTGA 8793

Acquisition completed.

✓ mulligan\_151700\_601 5% NaCl in H2O stat remnants

5830 FS



7-NHTSA 9794

1  
T-14178A 9785

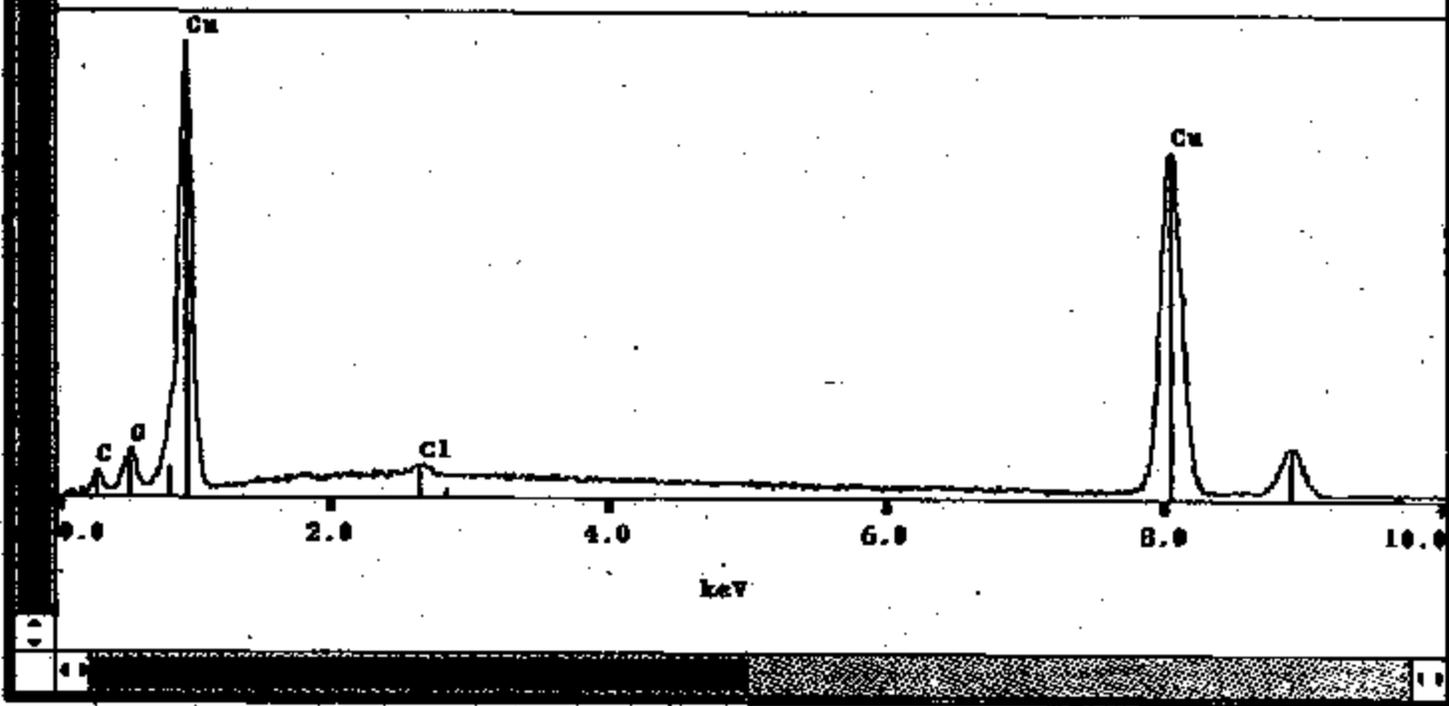


151700 24 Hrs Used Brake Fluid, movable blade back, bei 1000x 64

Acquisition completed.

✓ wolligan\_151700\_609 24H New BF mov. blade back

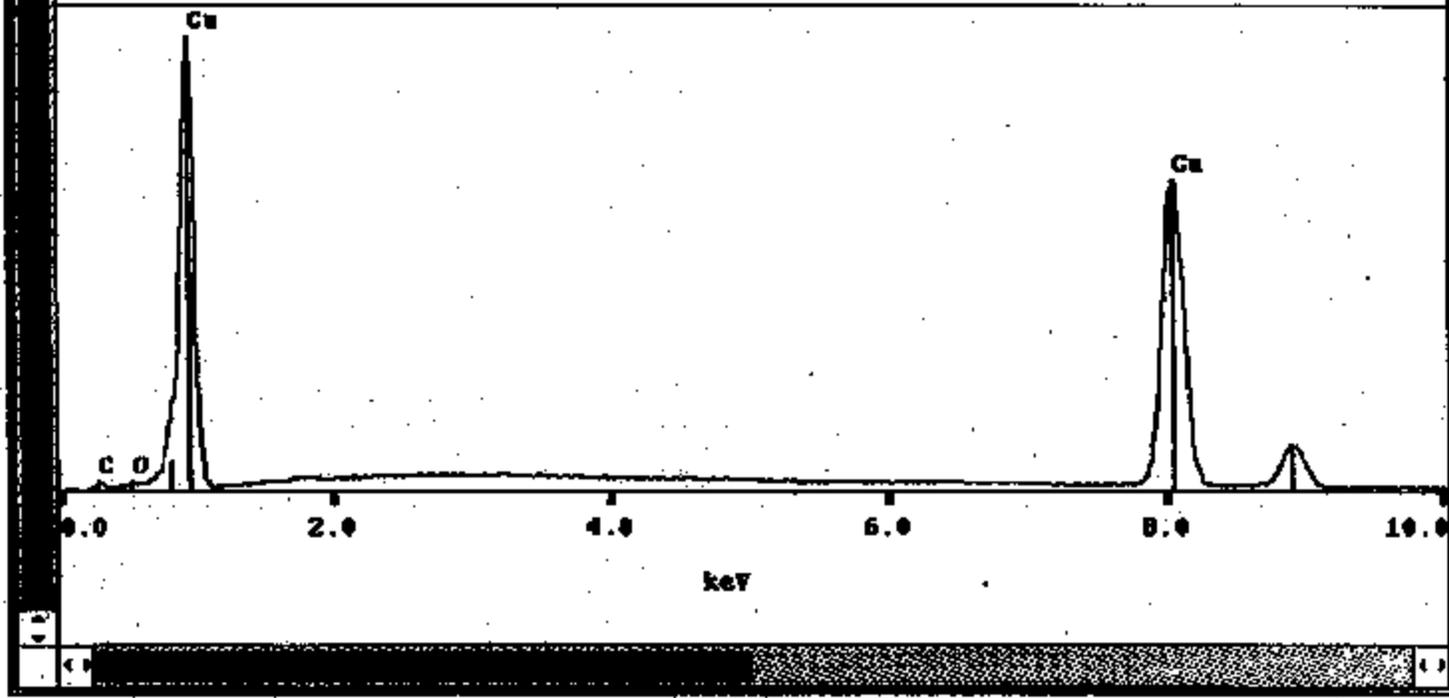
5119 FS



TI-NHTSA 9798

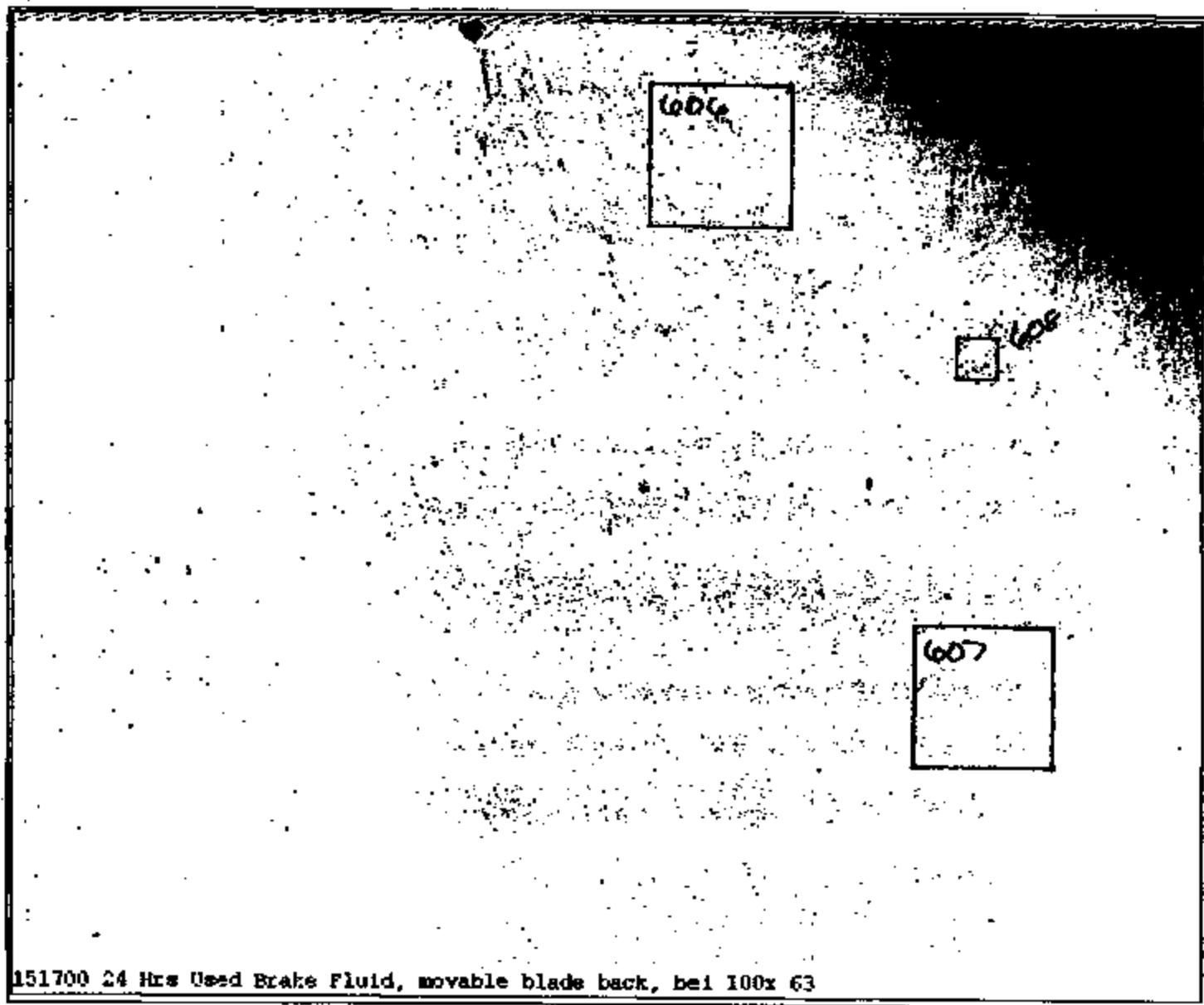
Acquisition completed.

✓ mulligan\_151700\_610 24H New BF mov. blade back 10213 FS



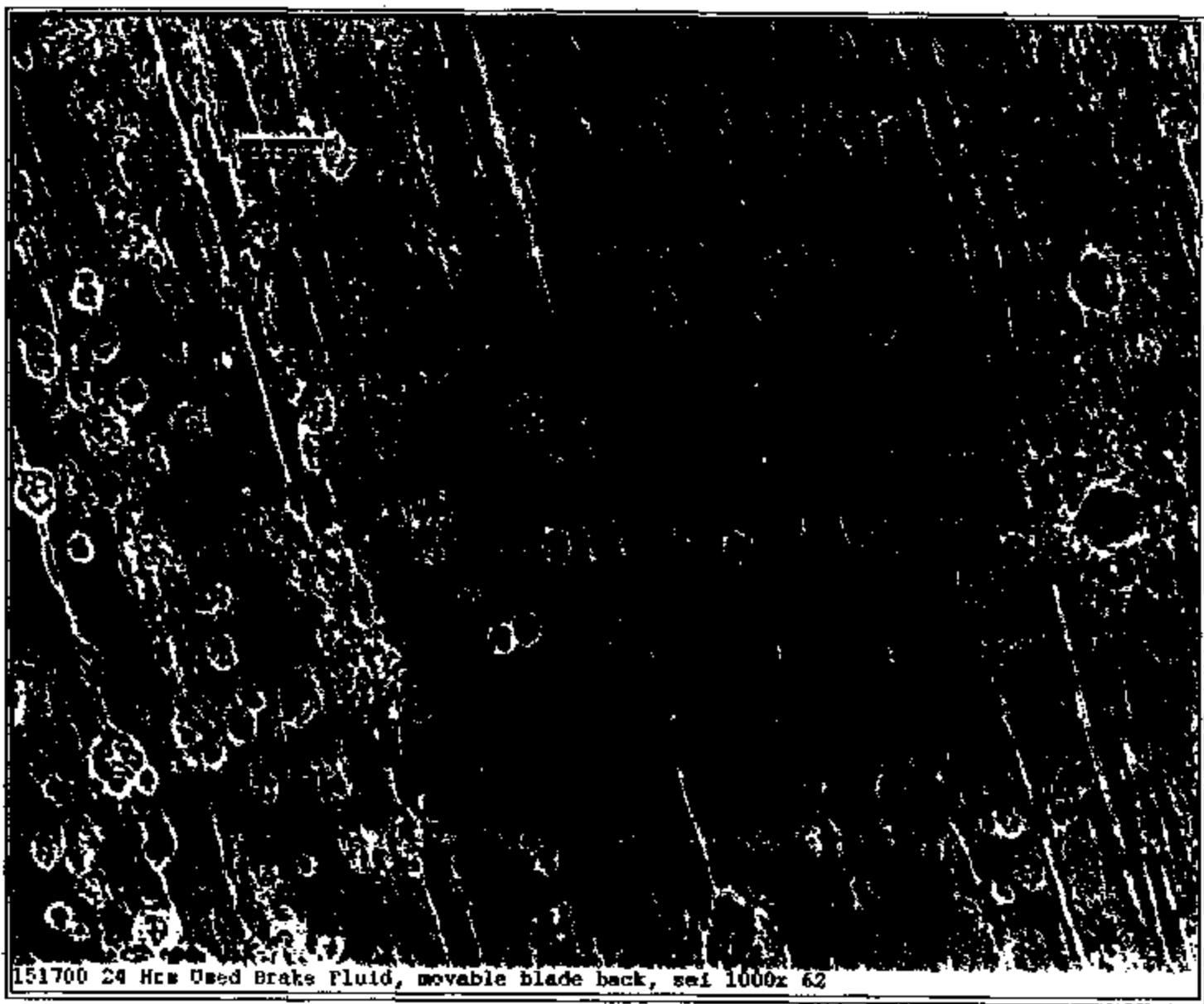
7101000000

TI-NHTSA 8798

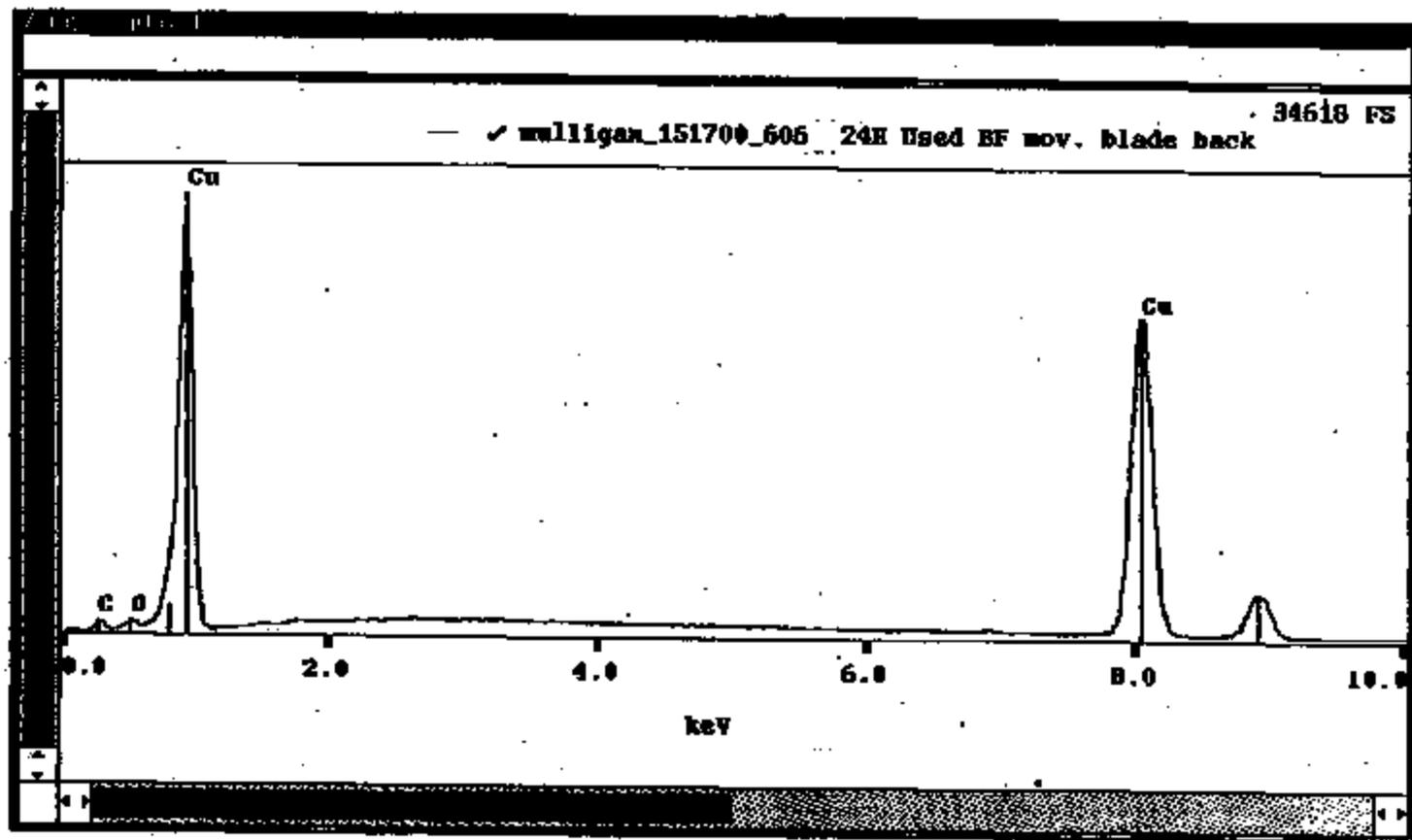


151700 24 Hrs Used Brake Fluid, movable blade back, bei 100x 63

TIANTSA 9799



151700 29 Hrs Used Brake Fluid, movable blade back, sei 1000x 62

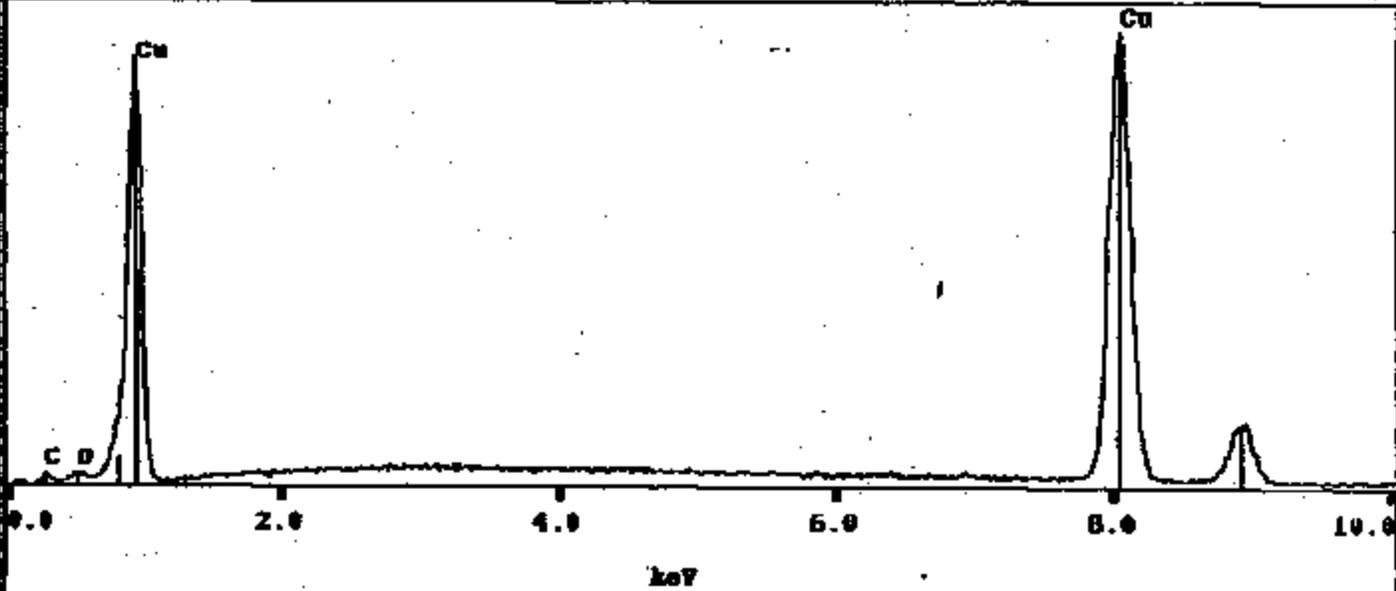


TI-NHTSA 9800

Acquisition completed.

— ✓ wulligan\_151700\_607 24N Used BF mov. blade back

5140 FS

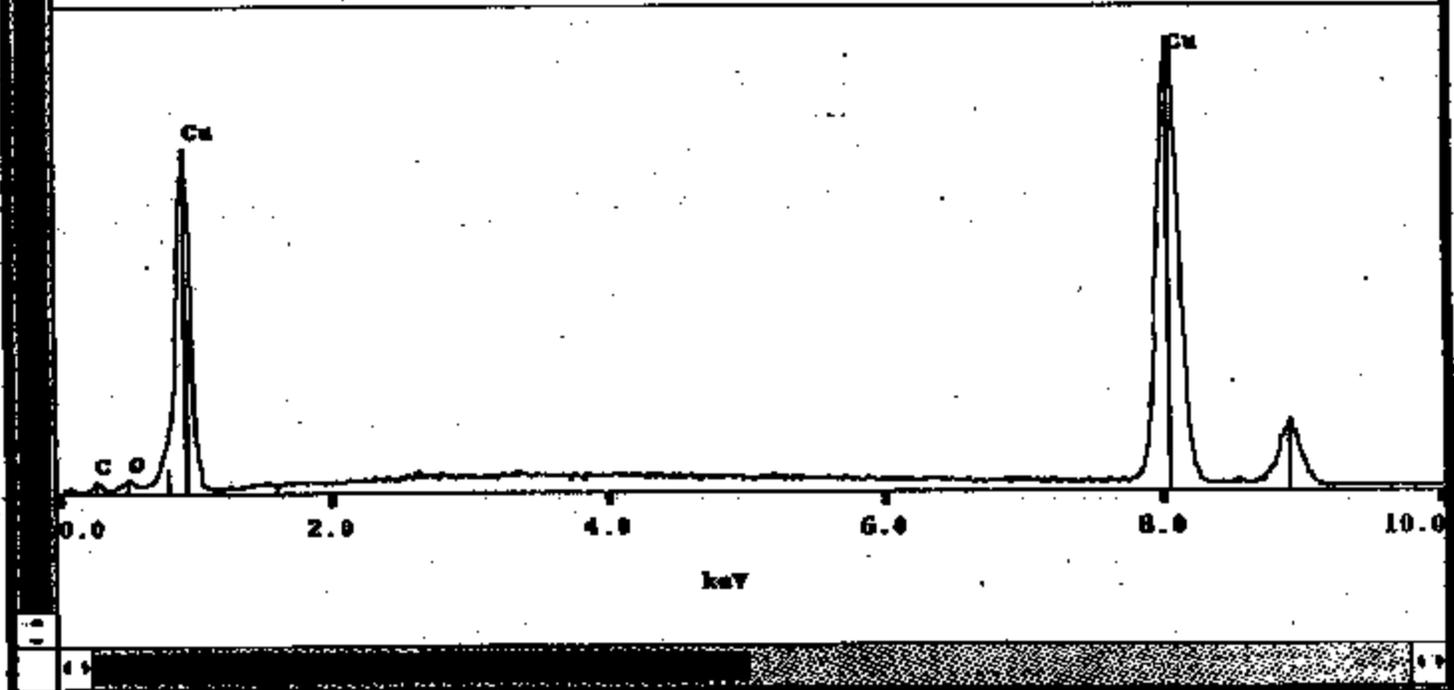


TI-NHTSA 0901

Acquisition completed.

4489 FS

— ✓ mulligan\_151700\_608 24H New RF mov. blade back



TI-NHTSA 9802

TO: SEAN NULLIGAN  
RUSS BAUMAN

ATTORNEY-CLIENT PRIVILEGED COMMUNICATION

99-243: TSL #'S 151700 & 142010: 77PS SIMULATION SAMPLES **ROUGH DRAFT**  
ONLY

**OBJECTIVE:**

Characterize the samples with regards to contamination, corrosion, and arcing.

**SAMPLE EXPOSED TO USED BRAKE FLUID FOR 24 HOURS:**

**CUP ANALYSIS:** The chromate layer is missing in many areas; generally we find relatively uncorroded zinc metal underneath; these areas appear shiny under optical examination. In areas where the chromate isn't missing, we find that substantial amounts of copper have been deposited on top of the chromate surface. A zone showing both types of these areas is shown at various magnifications in Photos 61-64. Elemental distribution maps are also shown in Photos 60 and 65. They show the nodular nature of this copper deposit. This is also documented in Spectra 500-520.

Both the cup and the switch cavity had large amounts of blackish deposit on them. The deposits on the contact arm are being analyzed in the Chem Lab by FT/IR spectroscopy. The deposits on the cup were mainly removed by gentle washing in isopropyl alcohol. Before and after optical photos were taken to document the effect of cleaning. We can't analyze grossly oily samples in the SEM since that would contaminate the equipment.

The data was collected under the guidelines of TSL-S-71, Rev A which can be accessed at <http://www-mcd.mc.ti.com/tsl/>. SEM-EDAX (Scanning Electron Microscope with Energy Dispersive Analysis of X-rays) analysis was used in the above described analysis. The data will be sent through the internal mail.

AL HOPKINS

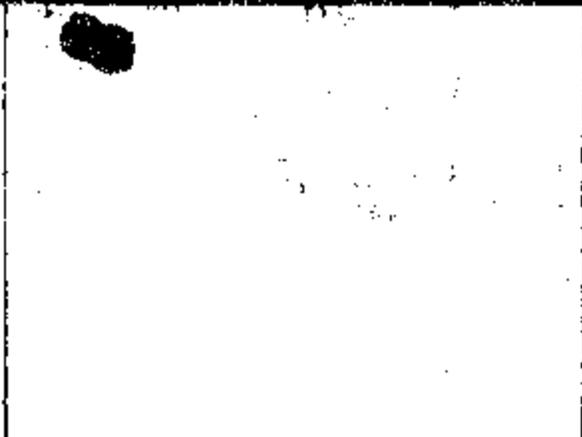
MSG ID: AHOP

PHONE: 508/236-3040

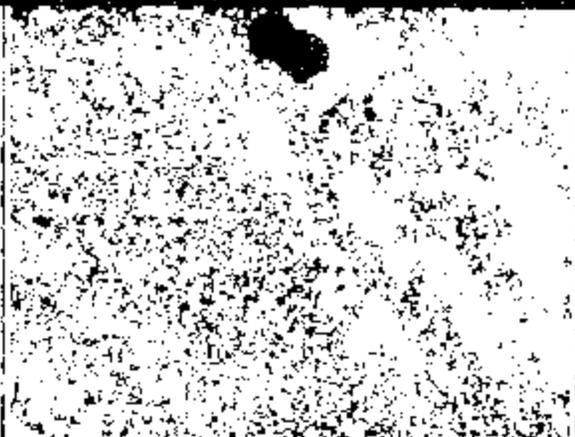
TI-NHTSA 0904



151700 24 Hrs Used Brake fluid cup 61



Cu K



Zn K



Fe K



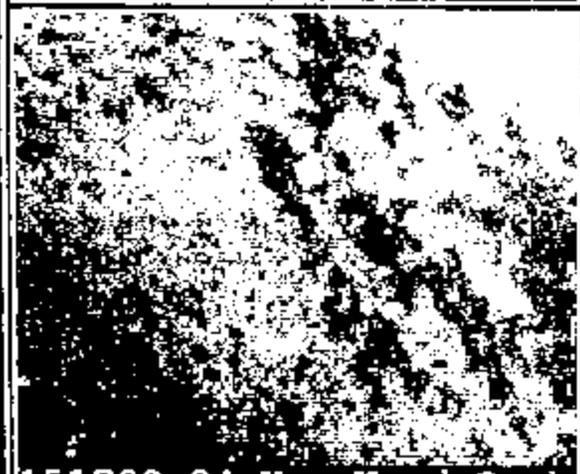
Ce K



O K



C K



151700 24 Hrs Used Peak

TI-NHTSA 8908



151700 24 Hrs Used Brake fluid clip 62

TI-NHTSA 9807



518,  
519  
520  
②  
5k0

515-517 ② 15 KEV

TI-NHTSA 9808



151700 24 lbs Used Brake fluid cup 64

15 REV

Cu K

Zn K

Fe K

Cr K

O K

C K



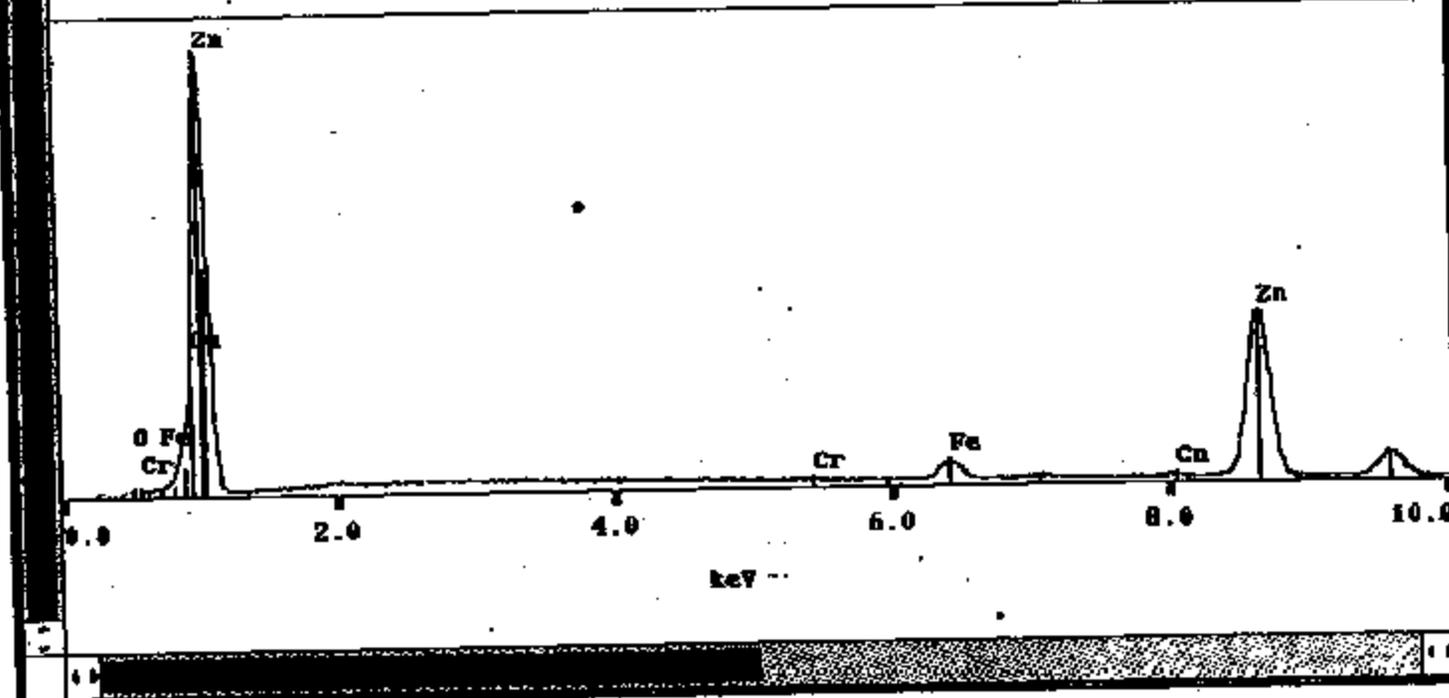
6808 VSLHNL

151700 24 Hrs Used Brak

Acquisition completed.

5274 FS

✓ mulligan\_151700\_510 24 hrs Used Brake Fluid

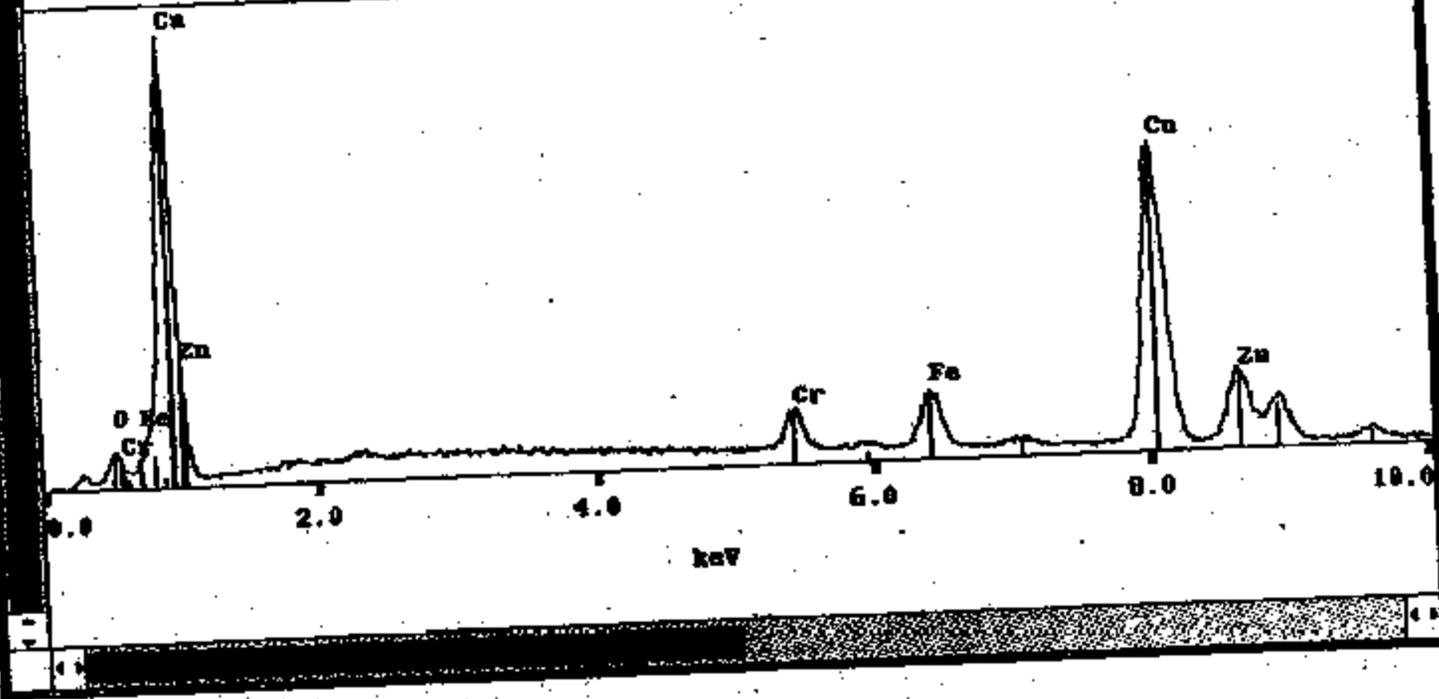


TI-NHTSA 9810

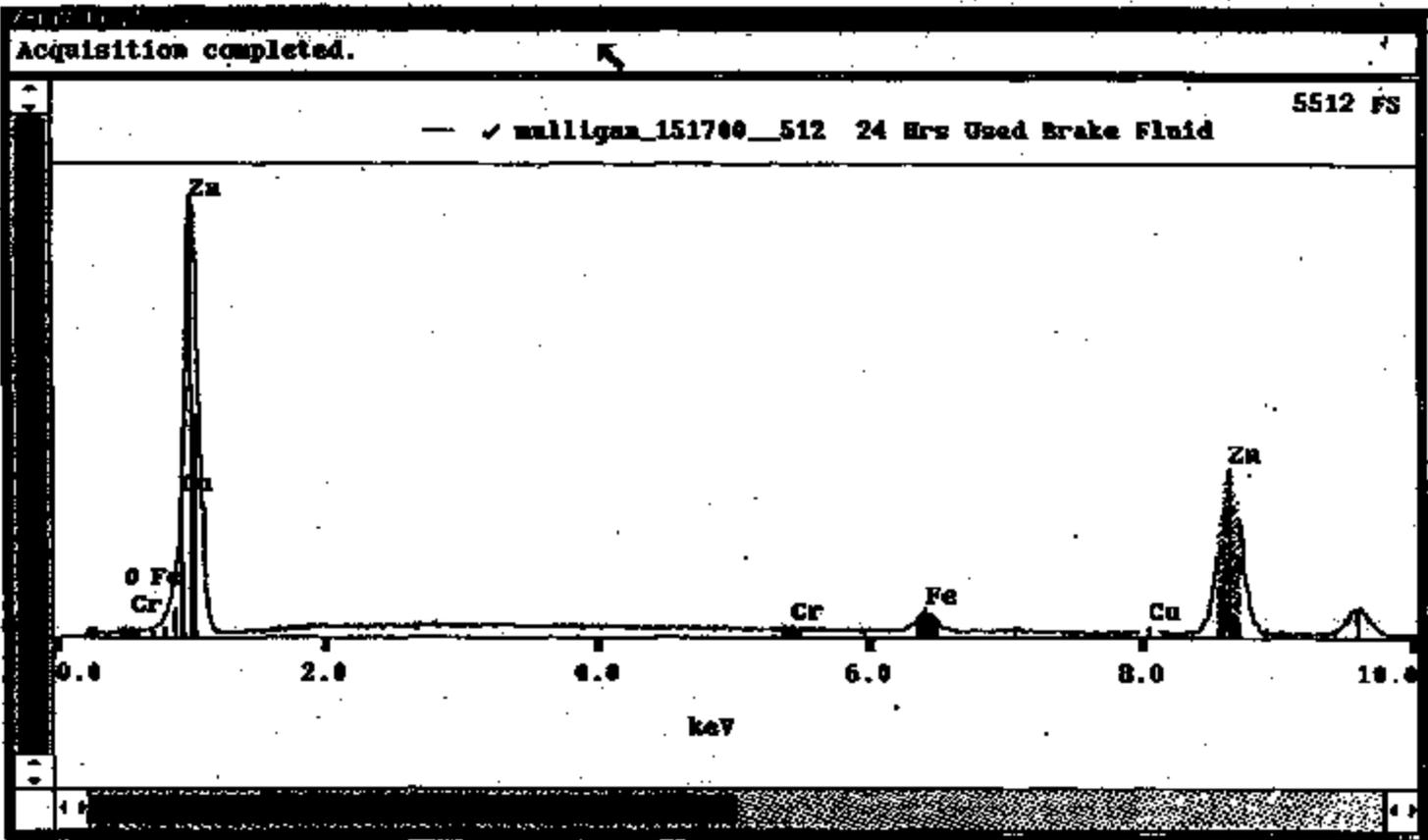
Acquisition completed.

4291 FS

✓ mulligan\_151700\_511 24 Hrs Used Brake Fluid



TI/NHTSA 9811

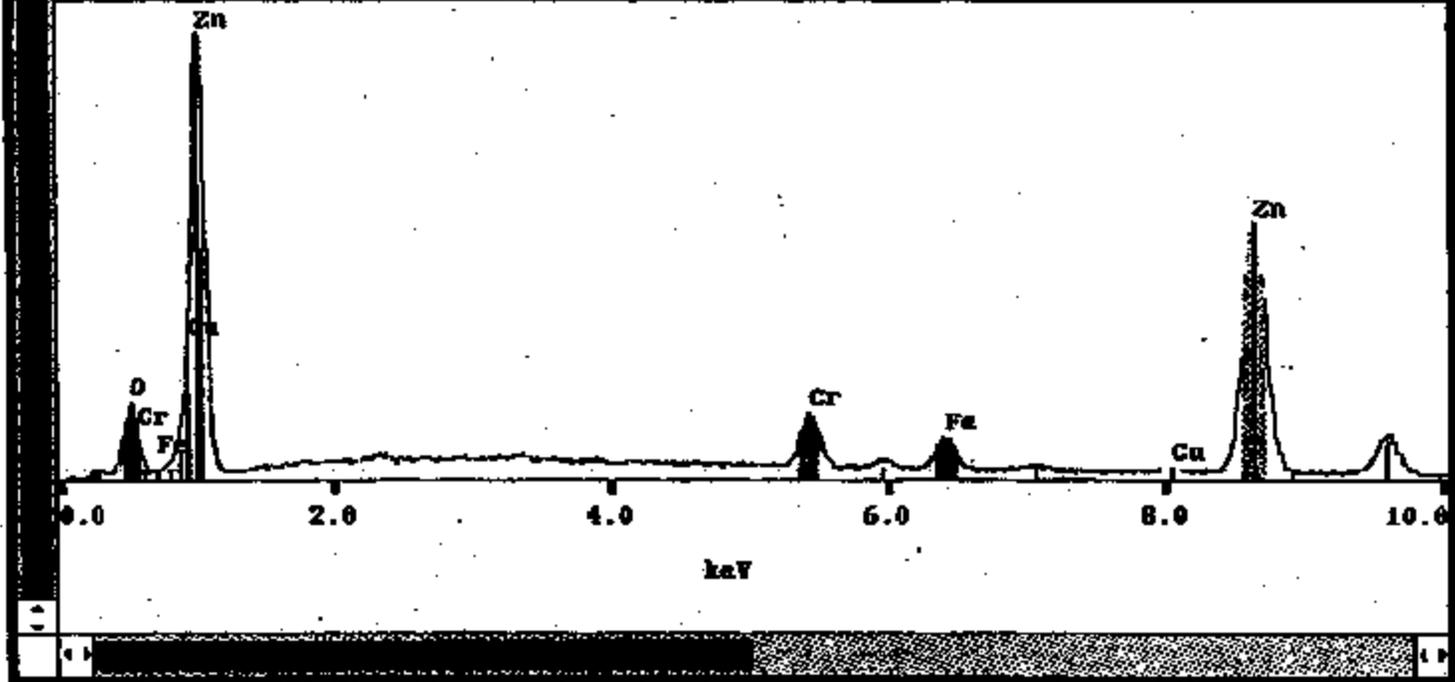


TI-NHTSA 9812

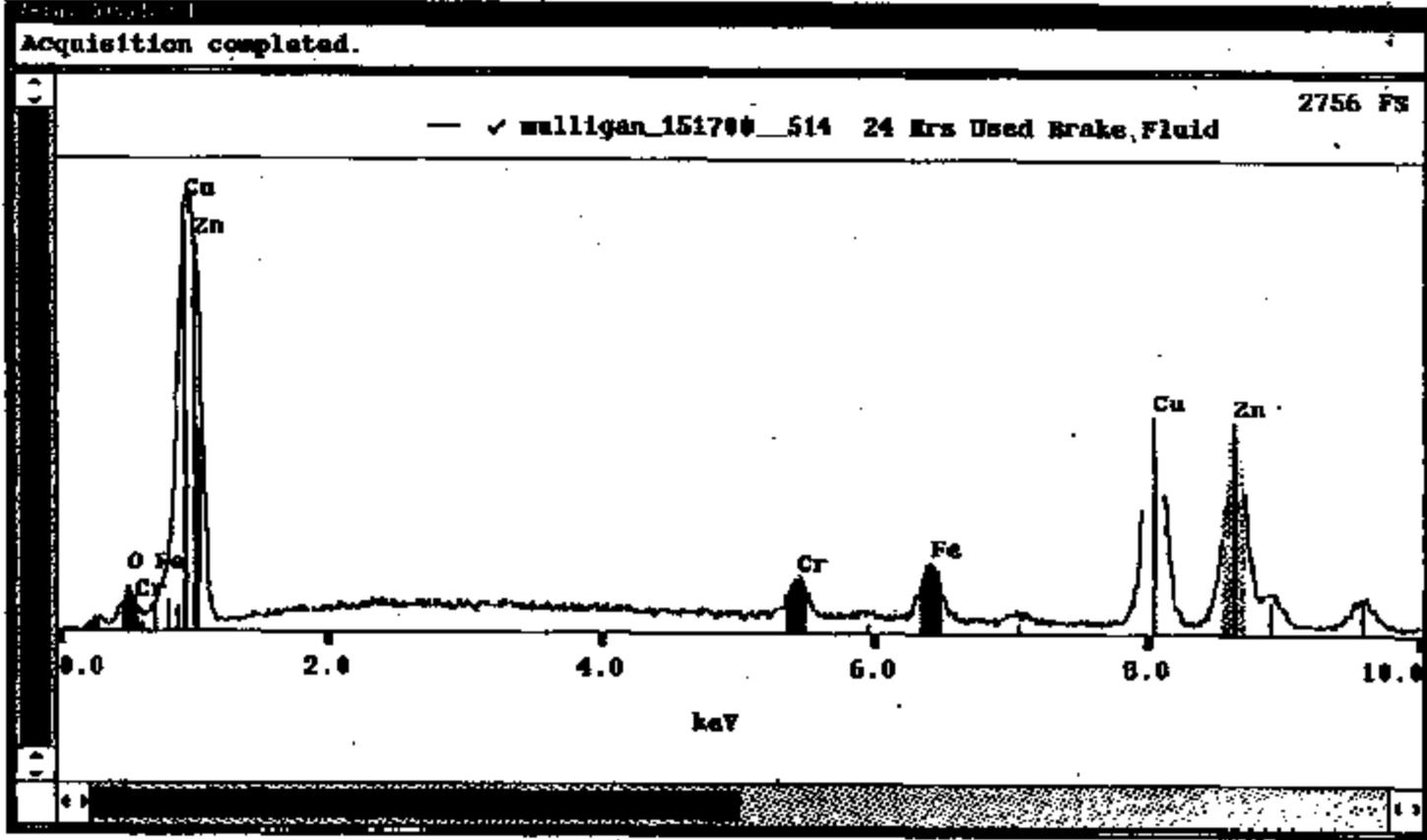
Acquisition completed.

✓ mulligan\_151700\_513 24 Hrs Used Brake Fluid

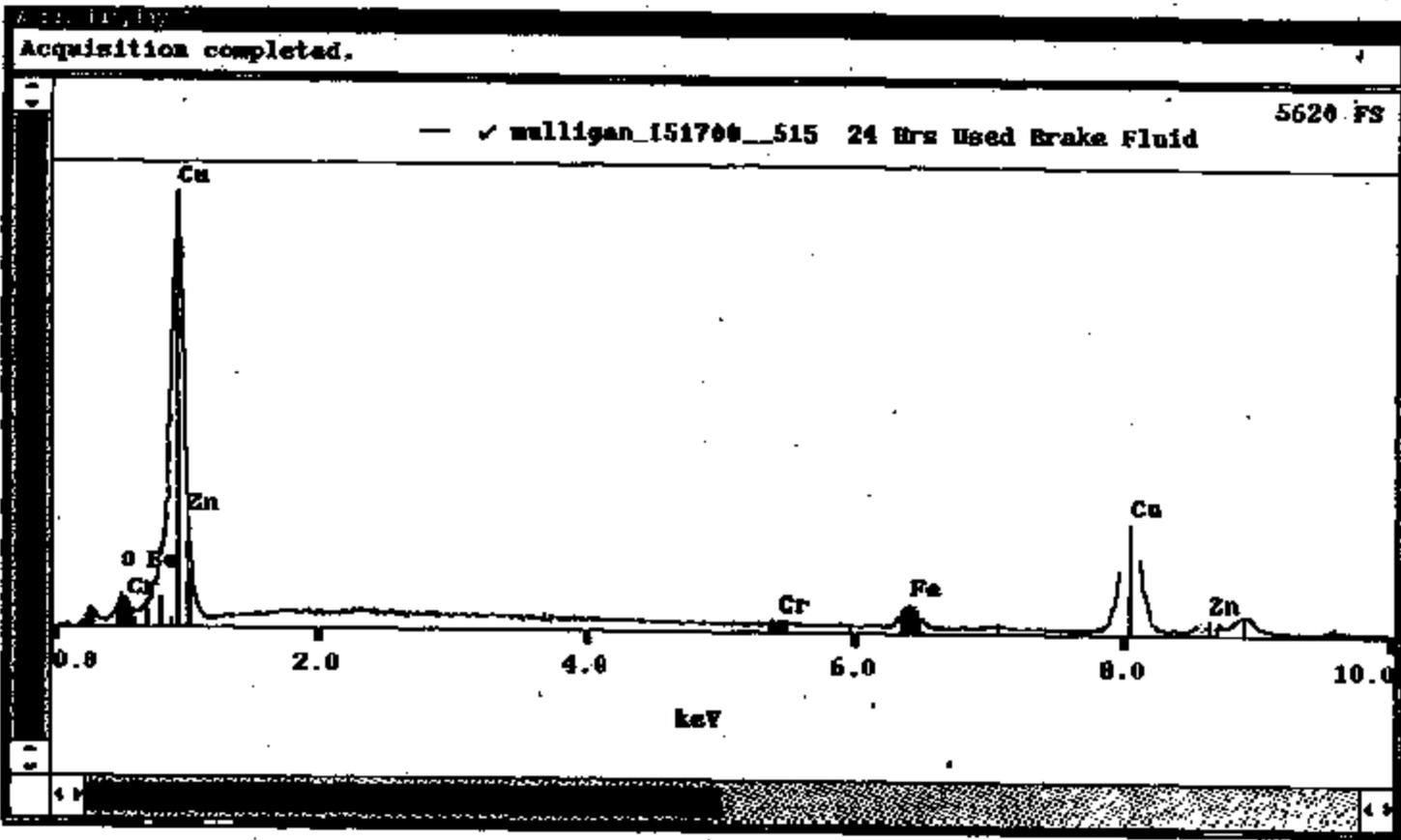
4400 FS



TI-NHTSA 9813



TI-NHTSA 9814

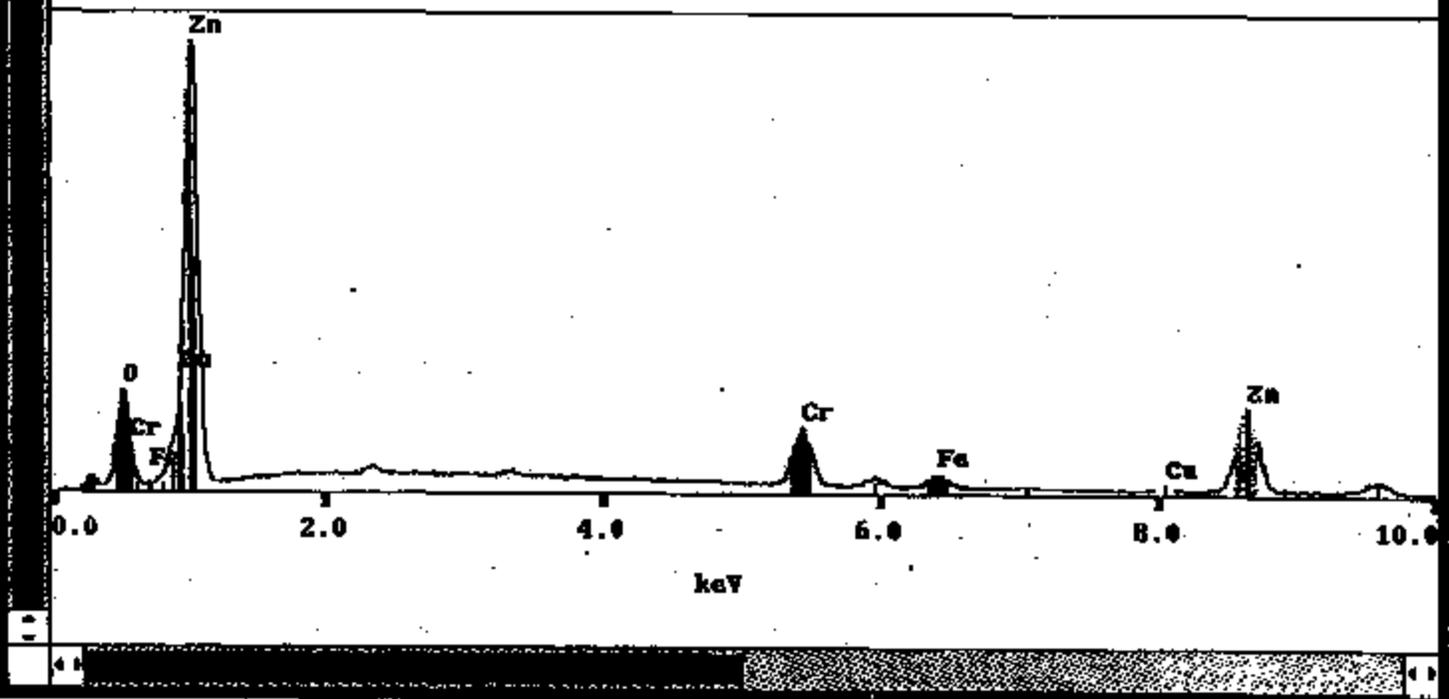


TL-NHTSA 9815

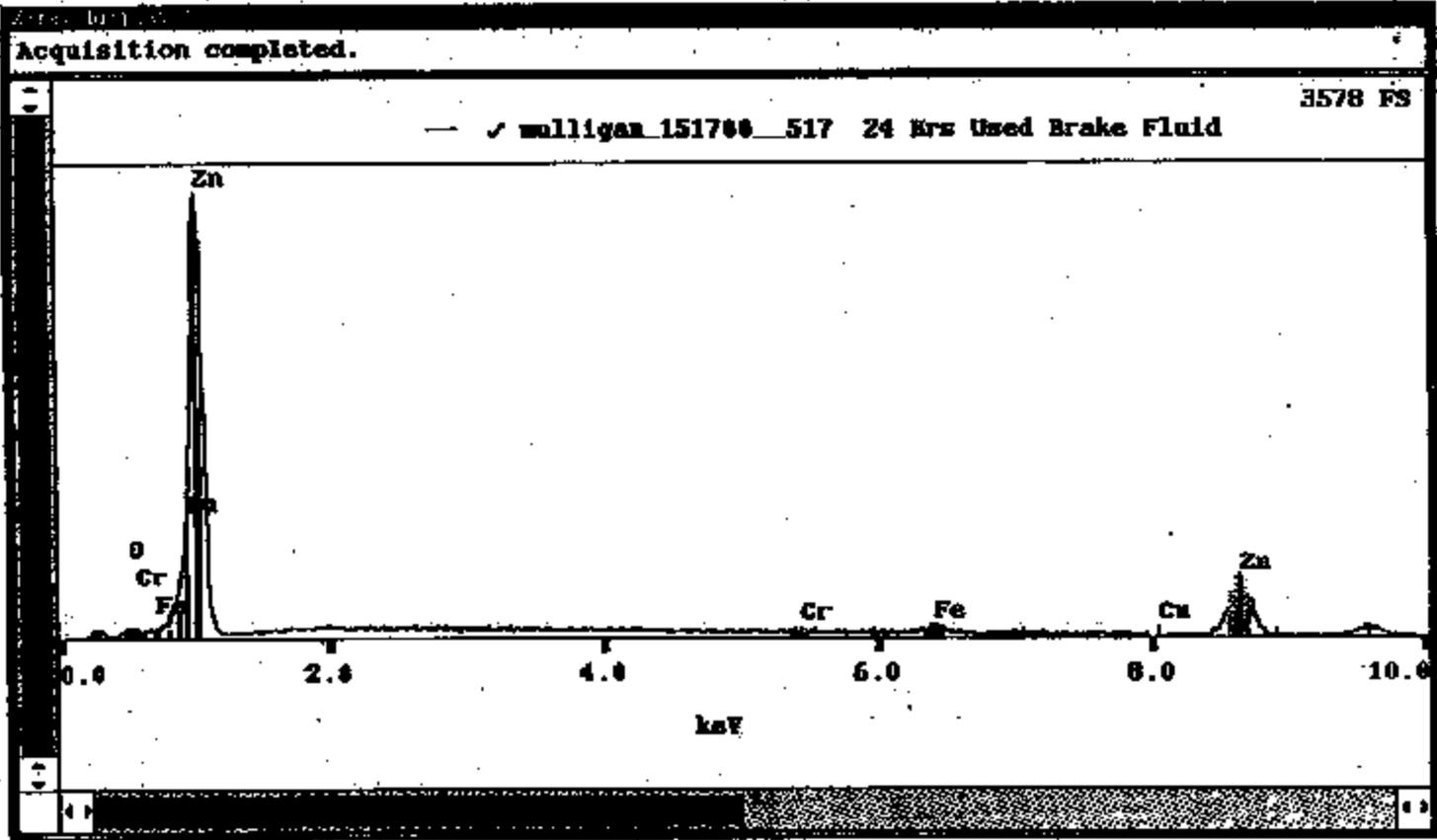
Acquisition completed.

✓ mulligan\_151700\_516 24 Hrs Used Brake Fluid

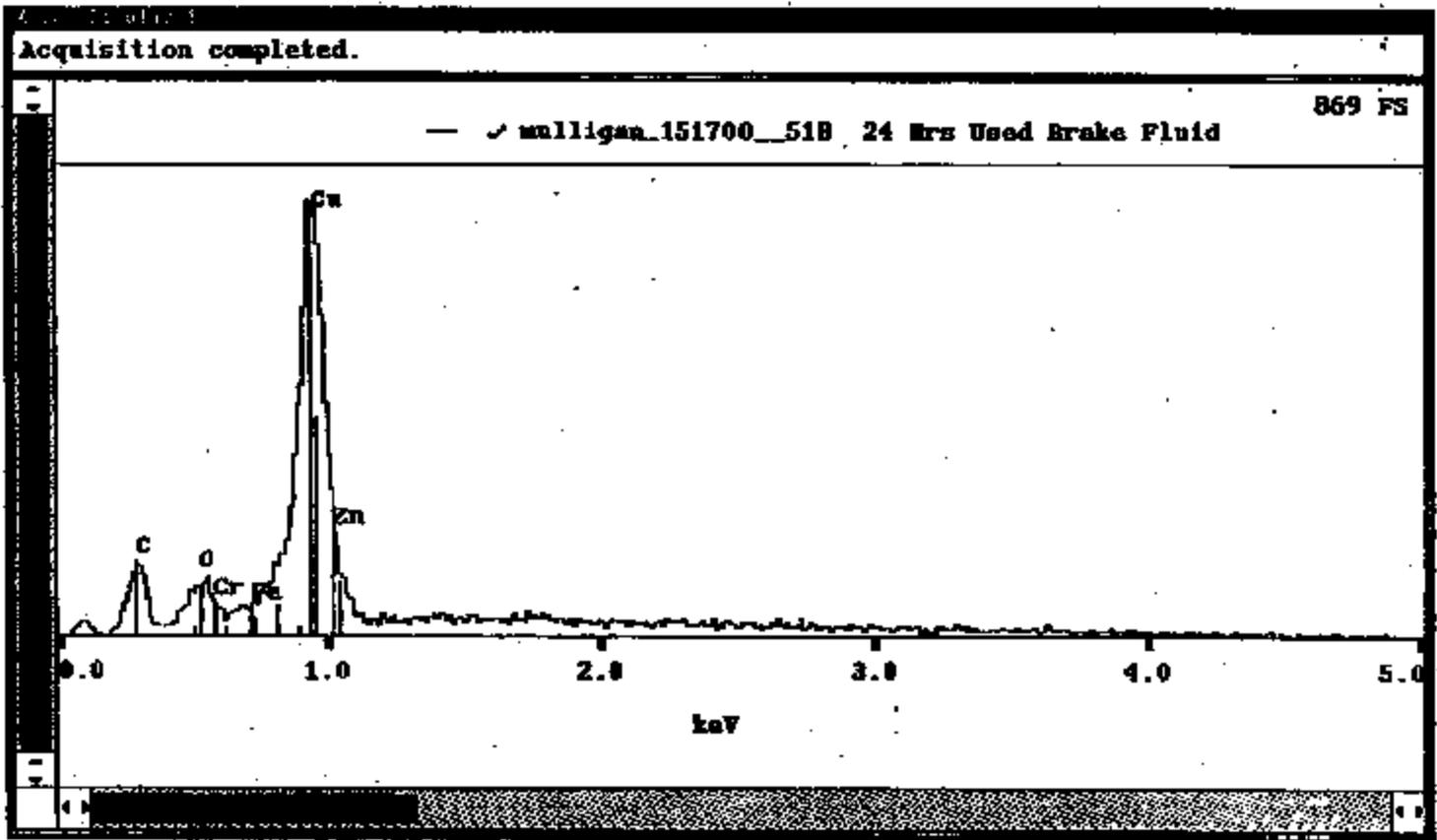
15005 FS



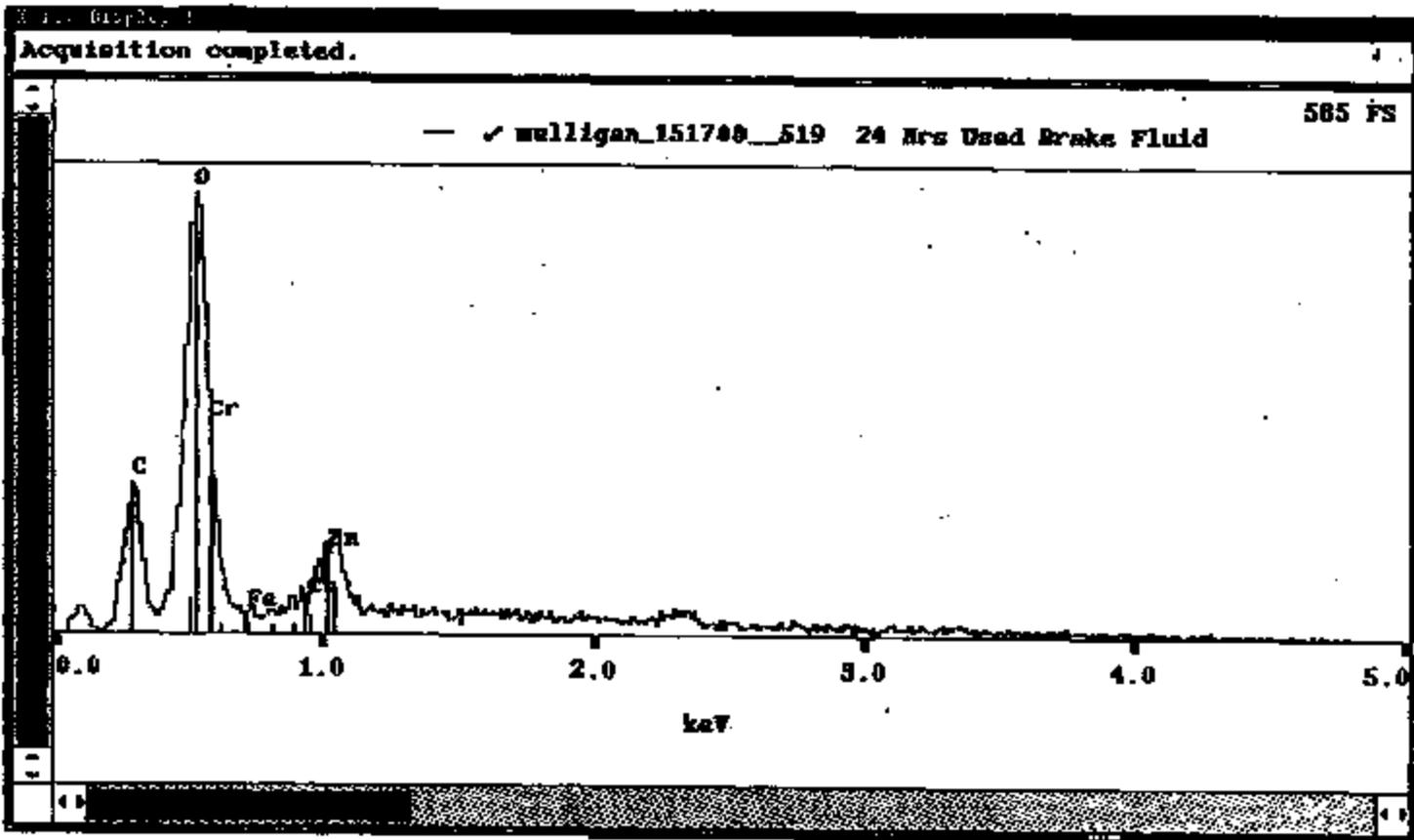
TI-NHTSA 9816



TRANSBA 9817



TI-NHTSA 9818

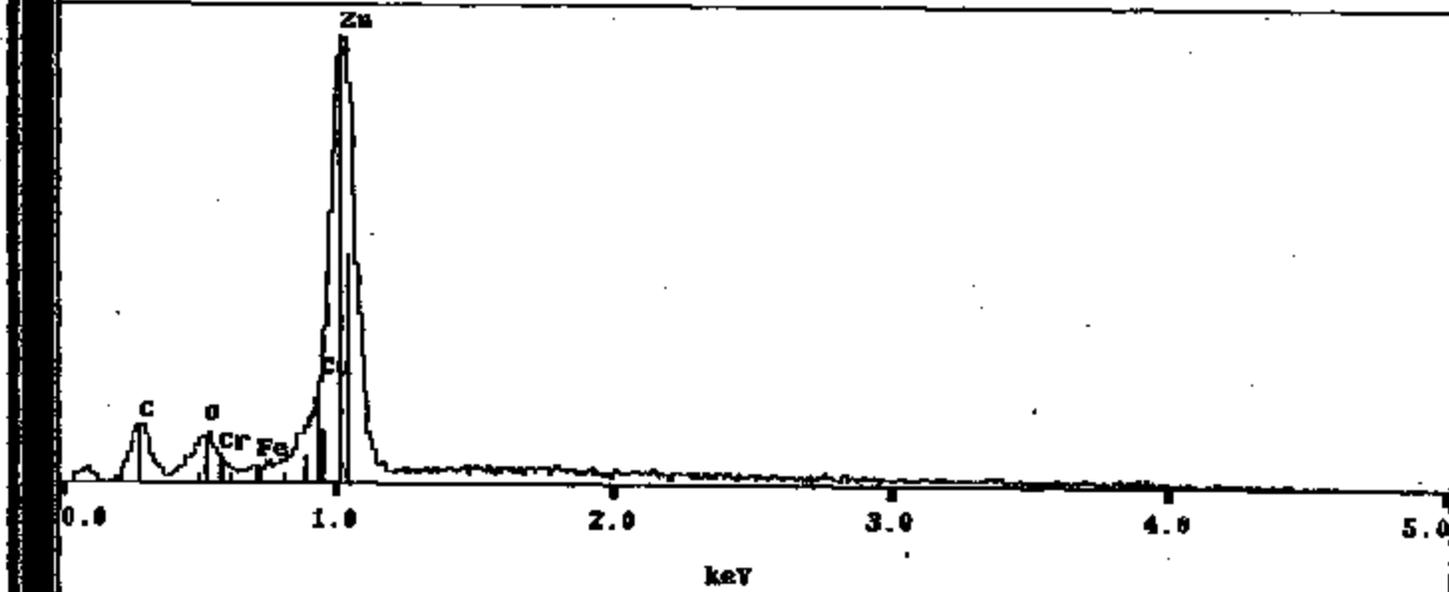


TI-NHTBA 0810

Acquisition completed.

✓ mulligan\_151740\_520 24 Hrs Used Brake Fluid

1142 FS



TRANHTSA 0820



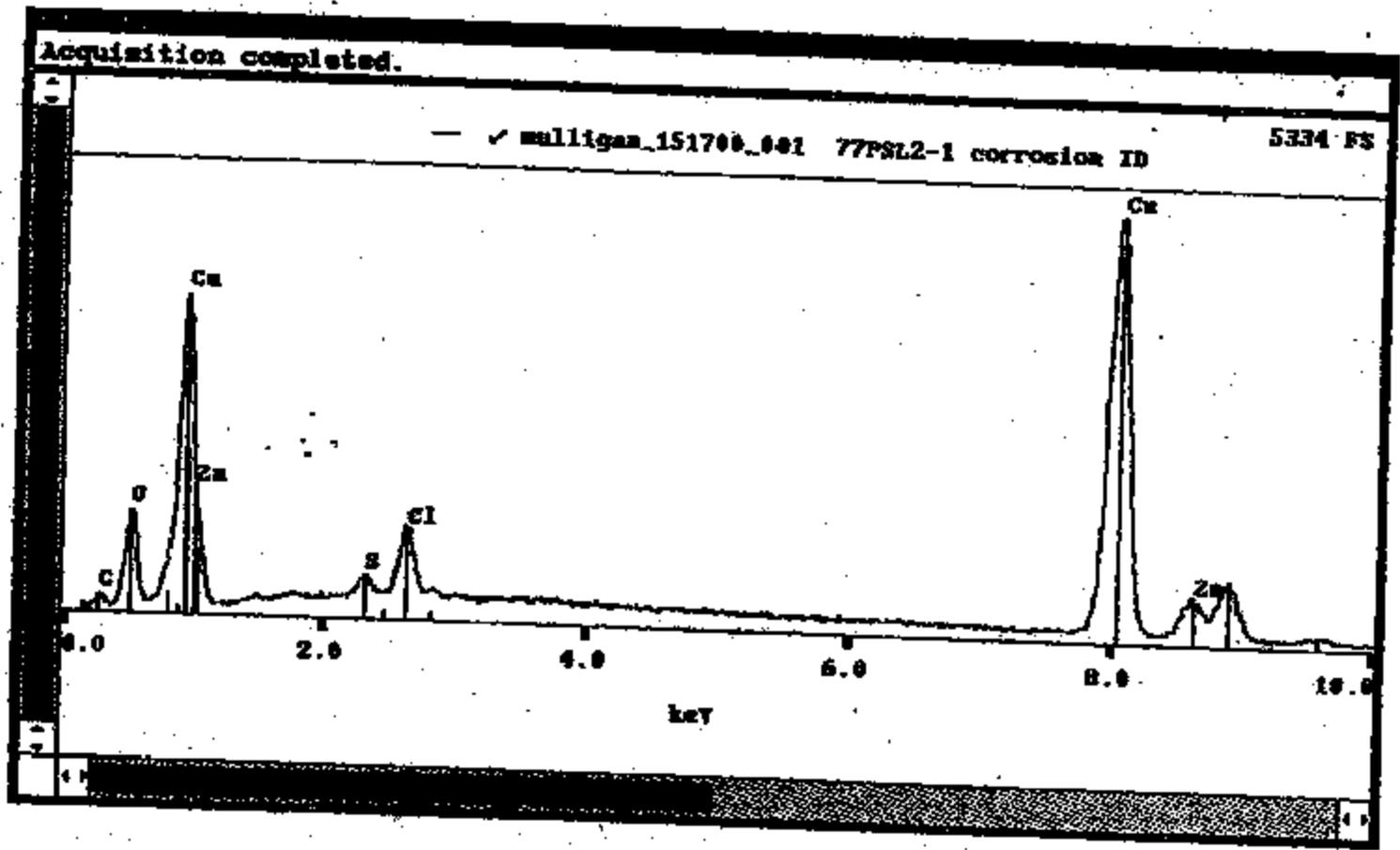
151700 778SL2-1, 5x salt water burn, bse 70x 01

TMHTSA 9821

Acquisition completed.

✓ mulligan\_151700\_001 77PSL2-1 corrosion ID

5334 FS

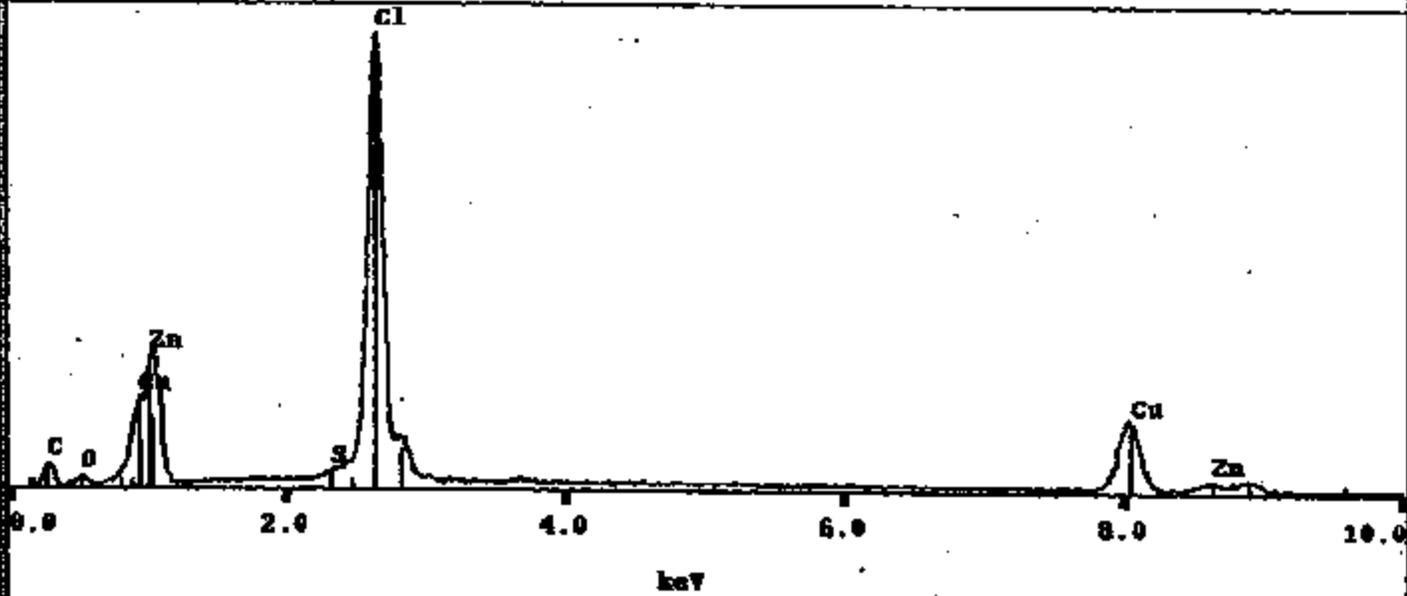


TI-NHTSA 9822

Acquisition completed.

✓ nulligan\_151700\_062 77PSL2-1 corrosion ID

7898 FS

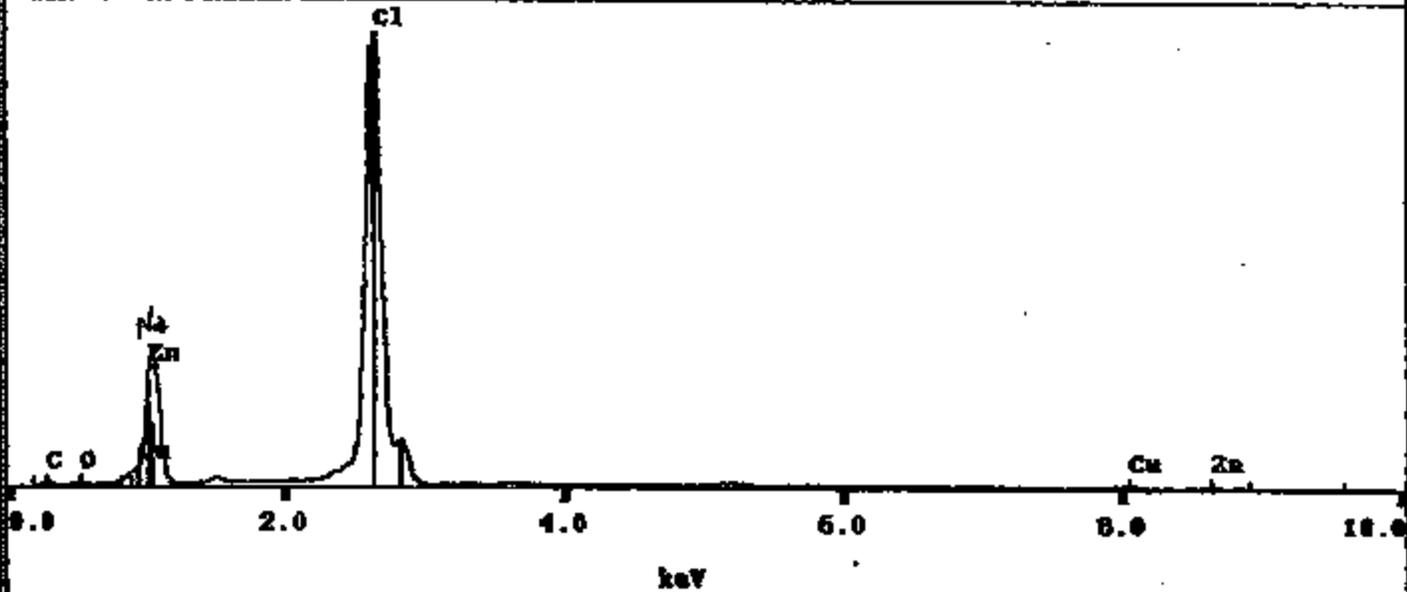


TI-NHTSA 9823

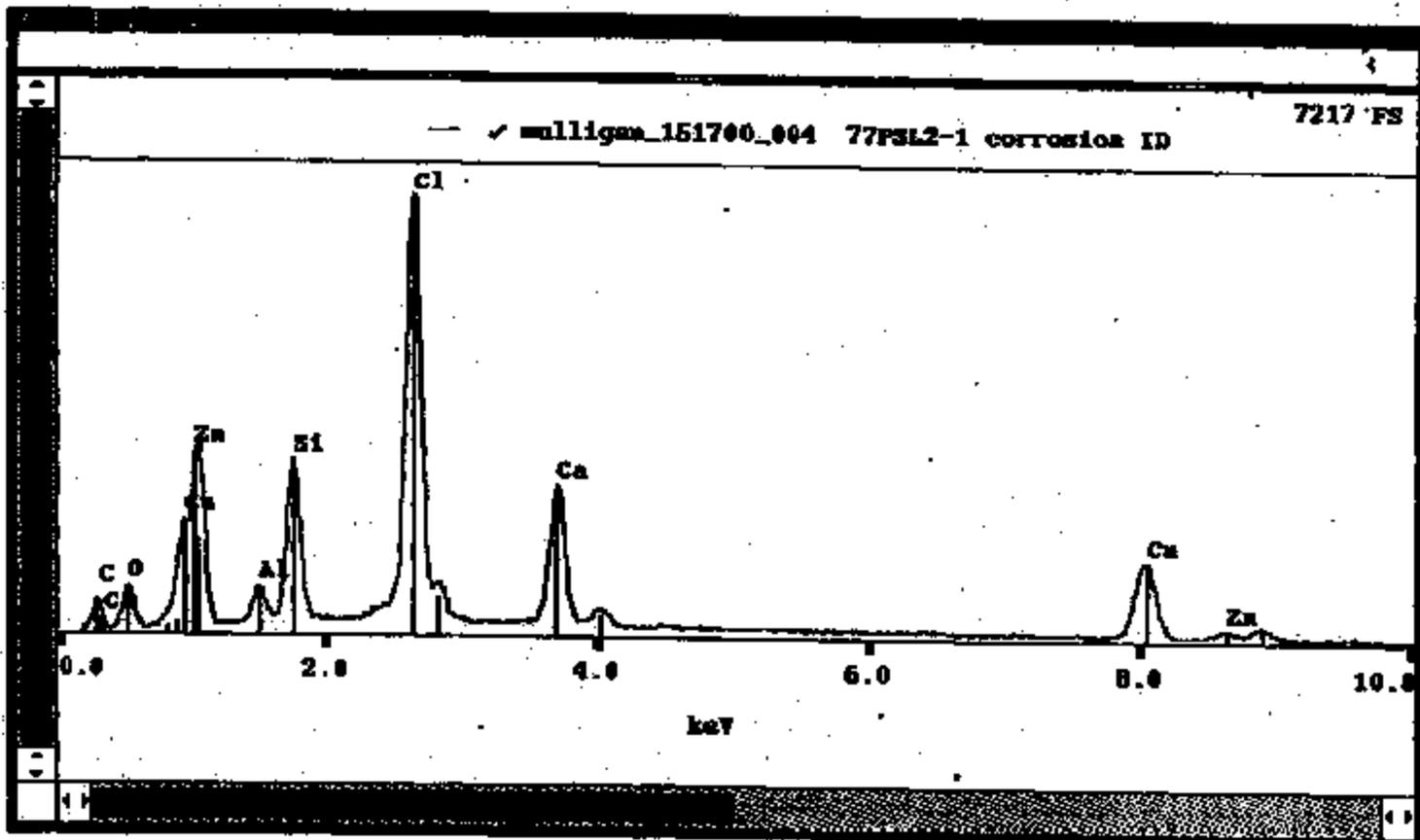
Acquisition completed.

✓ malligan\_151700\_003 77P312-1 corrosion ID

25967 FS



TI-NHTSA 9824

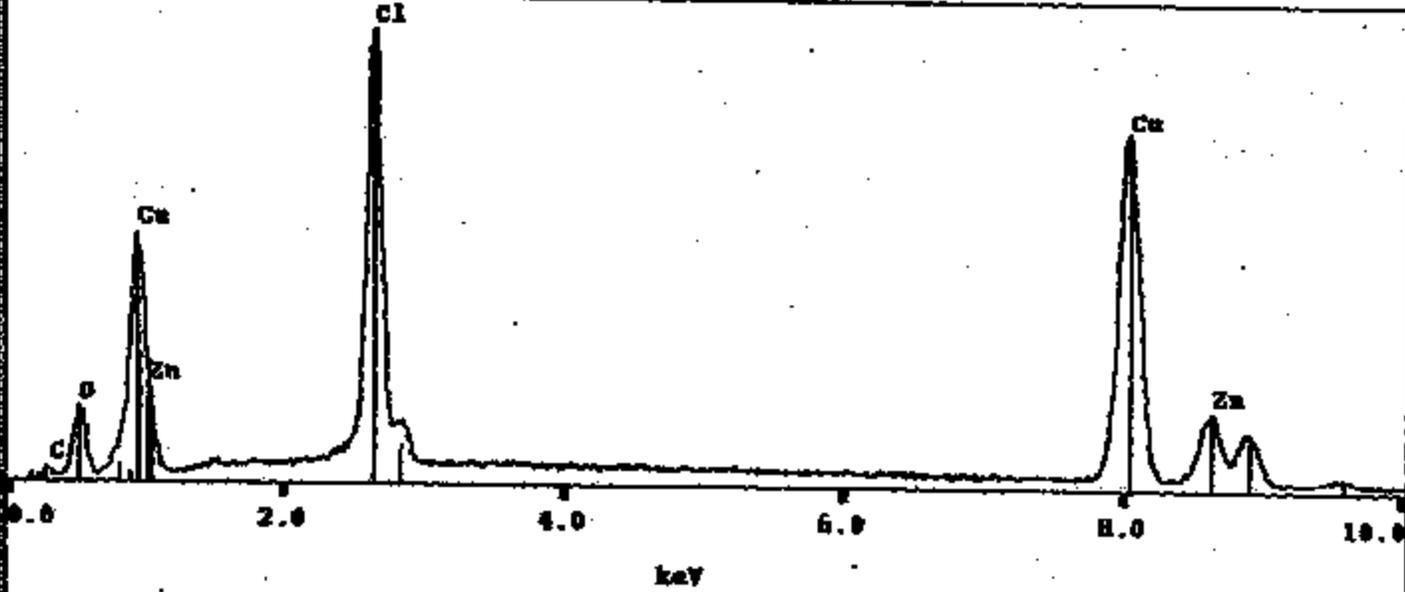


TI-NHTSA 9825

Acquisition completed.

✓ walligas\_151700\_005 T7PSL2-1 corrosion ID

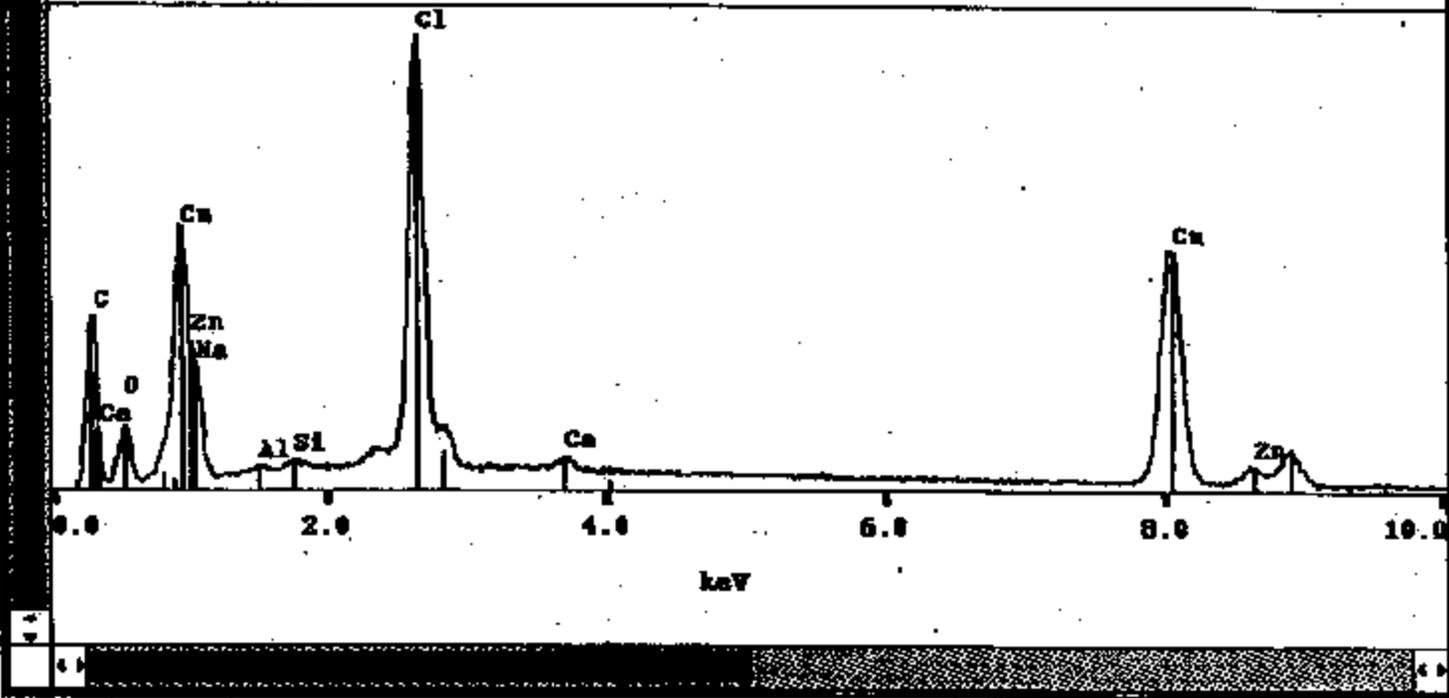
5050 FS



Acquisition completed.

5643 FS

✓ nulligan\_151700\_007 77PBL2-1 corrosion ID

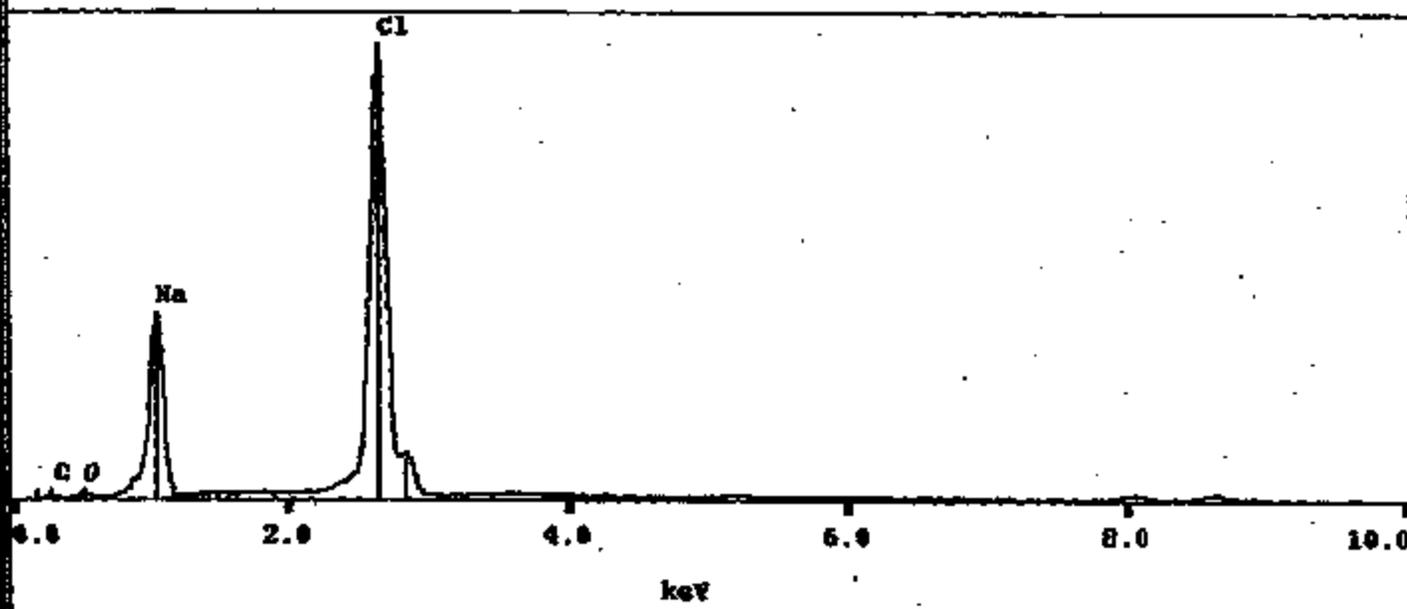


TI-NHTSA 0027

Acquisition completed.

✓ nulligan\_151740\_606 77PBL2-1 corrosion ID

14412 FS



TI-NHTSA 8828

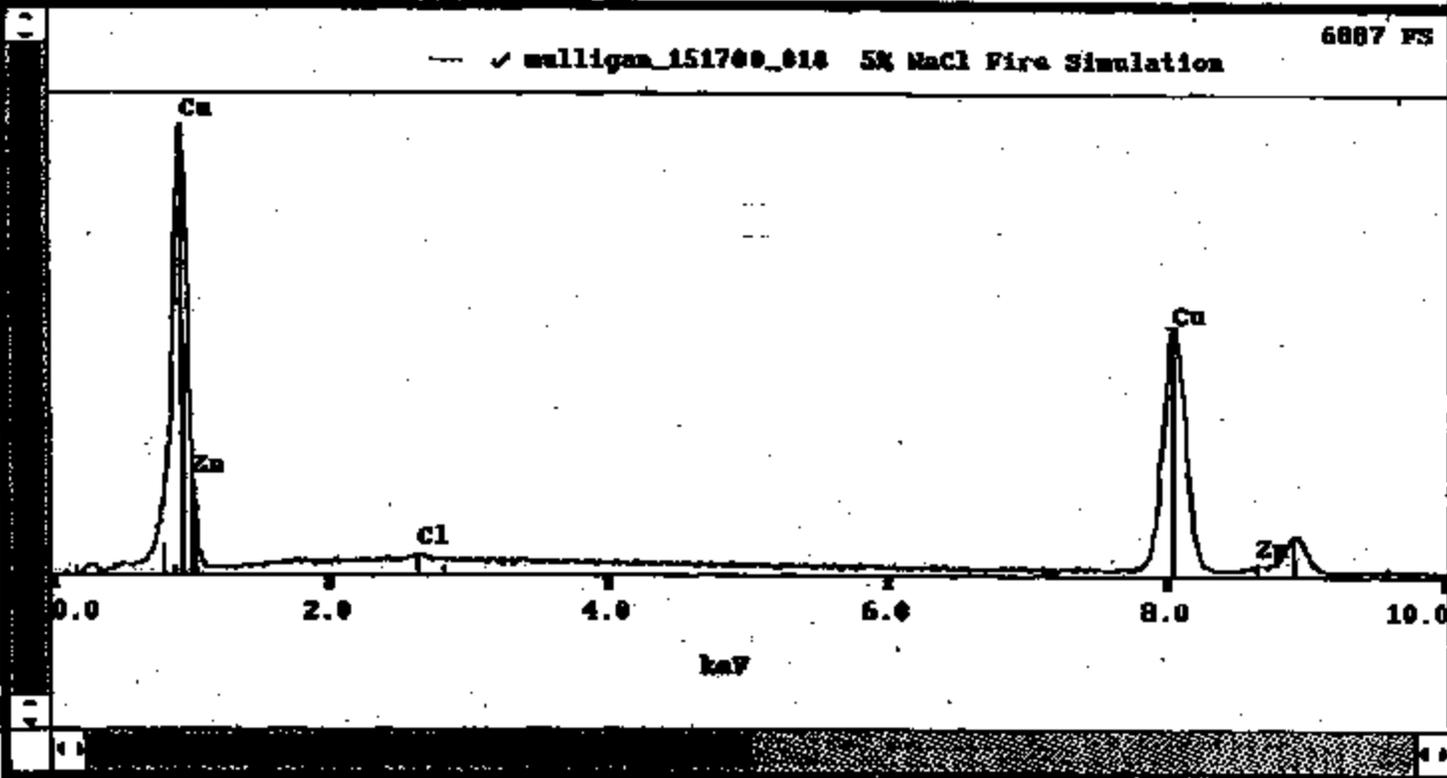
TI-NHTSA 9820



TAUHTEA 9830

051700 5# NaCl Fire Simulation

Acquisition completed.



TI-NHTSA 9831

TI-NHTSA 0832



151700 5% NaCl Fire Simulation Fractured/Arced Edge 33

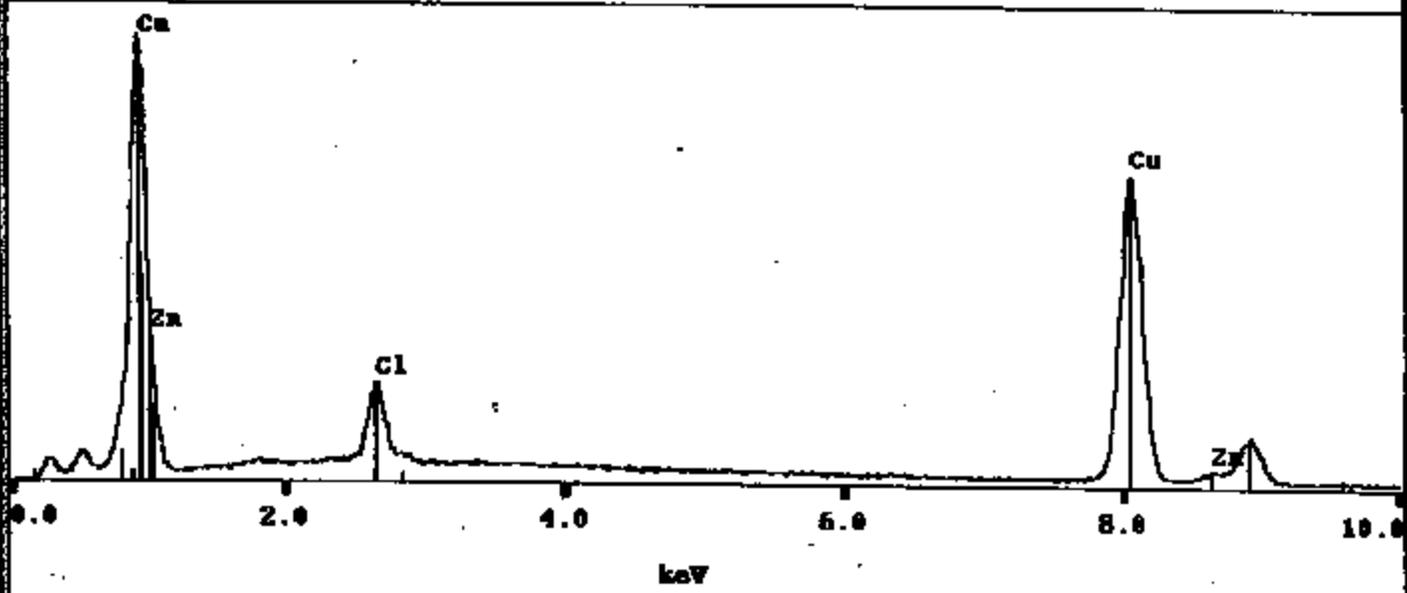
TI-NHTSA 8833

151700 5# NaCl Fire Simulation Fractured/Arced Edge 32

Acquisition completed.

✓ mulligan\_151700\_011 5% NaCl Fire Simulation

6789 FS



TI-NHTSA 9834

TI-NHTSA 8636



TI-NHTSA 9830



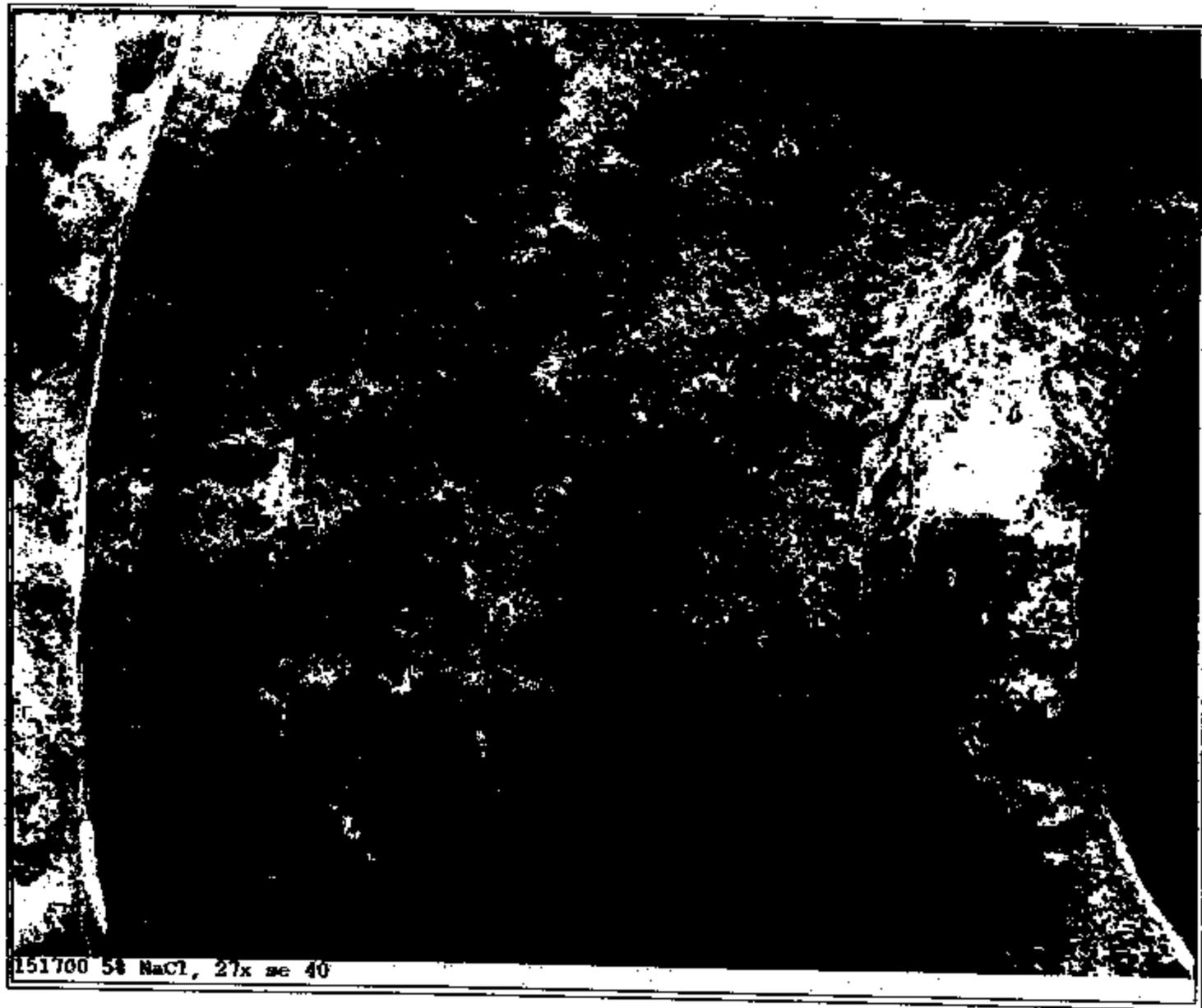
151700 58 NaCl, 27x bse 41

TI-NHTSA 9837

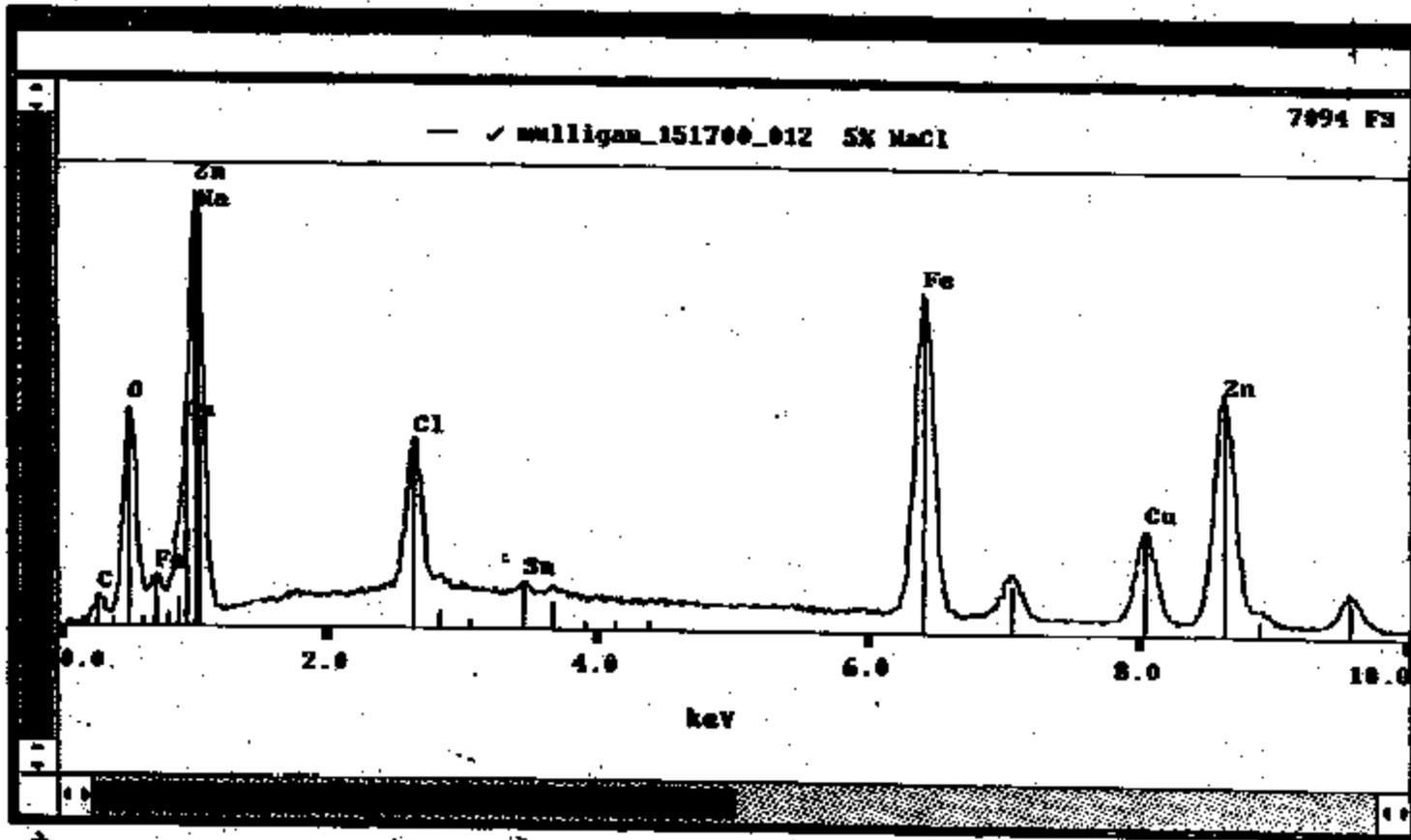


151700 50 NaCl, 27x base 41

TAHITSA 9839



151700 54 NaCl, 27x ac 40

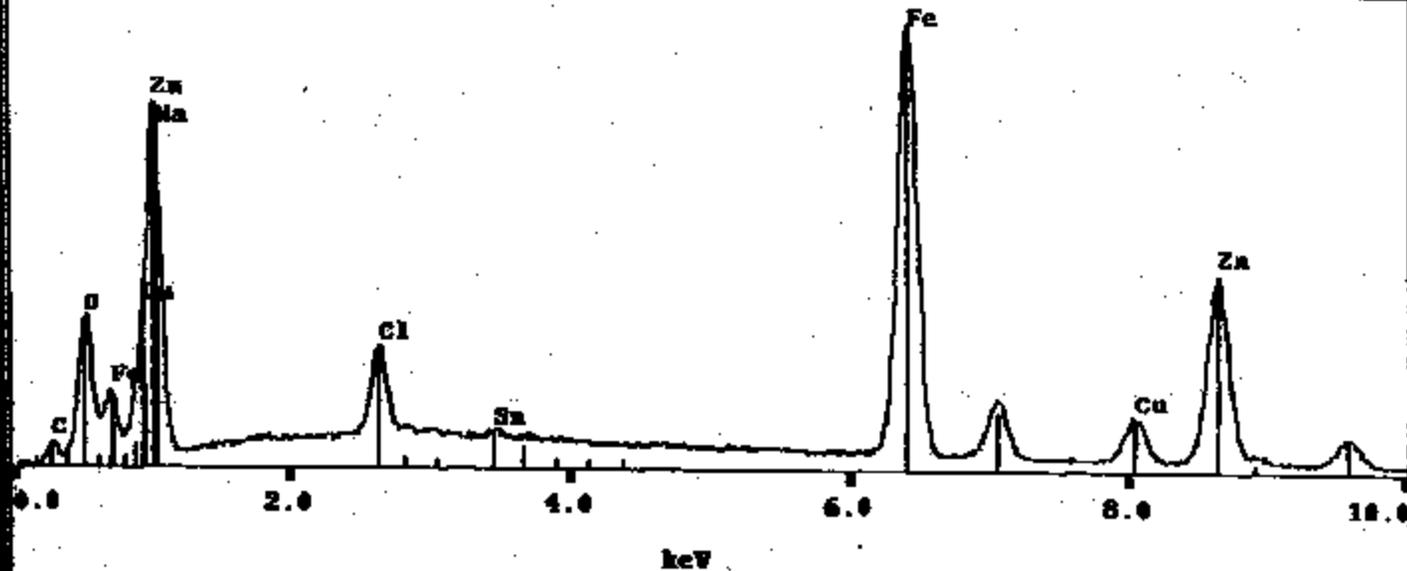


TIAMTSA 8839

Acquisition completed.

✓ Mulligan\_151700\_013 SX NaCl

6343 FS

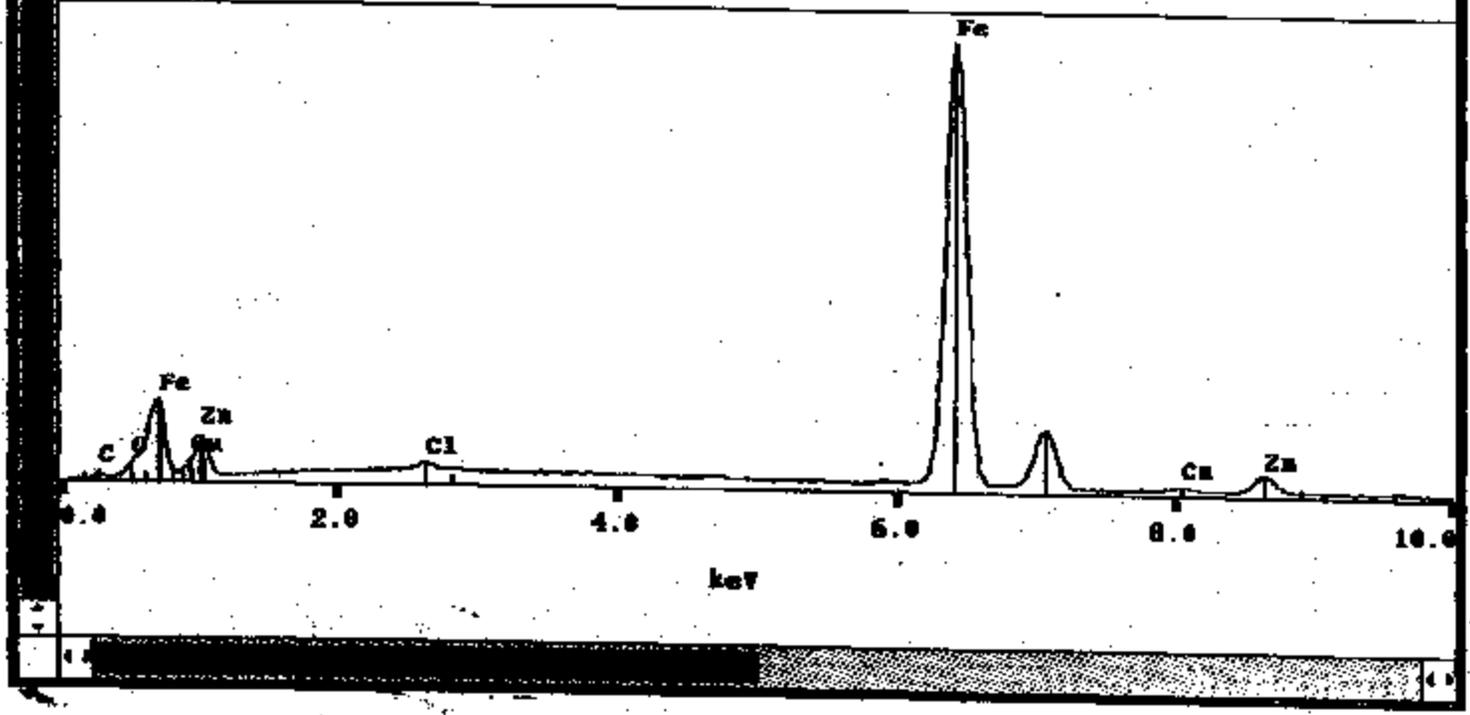


TI-NHTSA 9840

Acquisition completed.

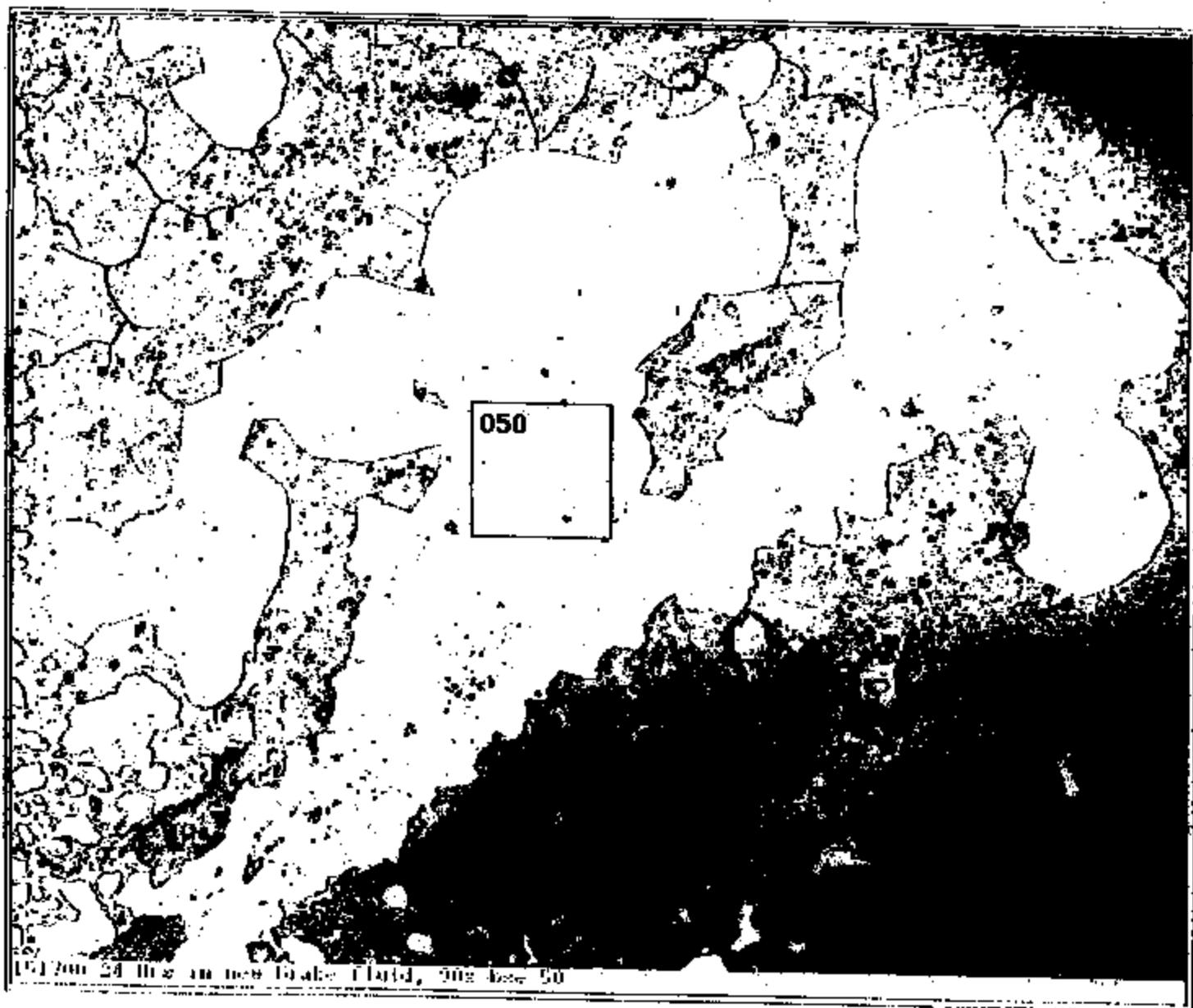
✓ mulligan\_151700\_014 5% NaCl

21251 FS

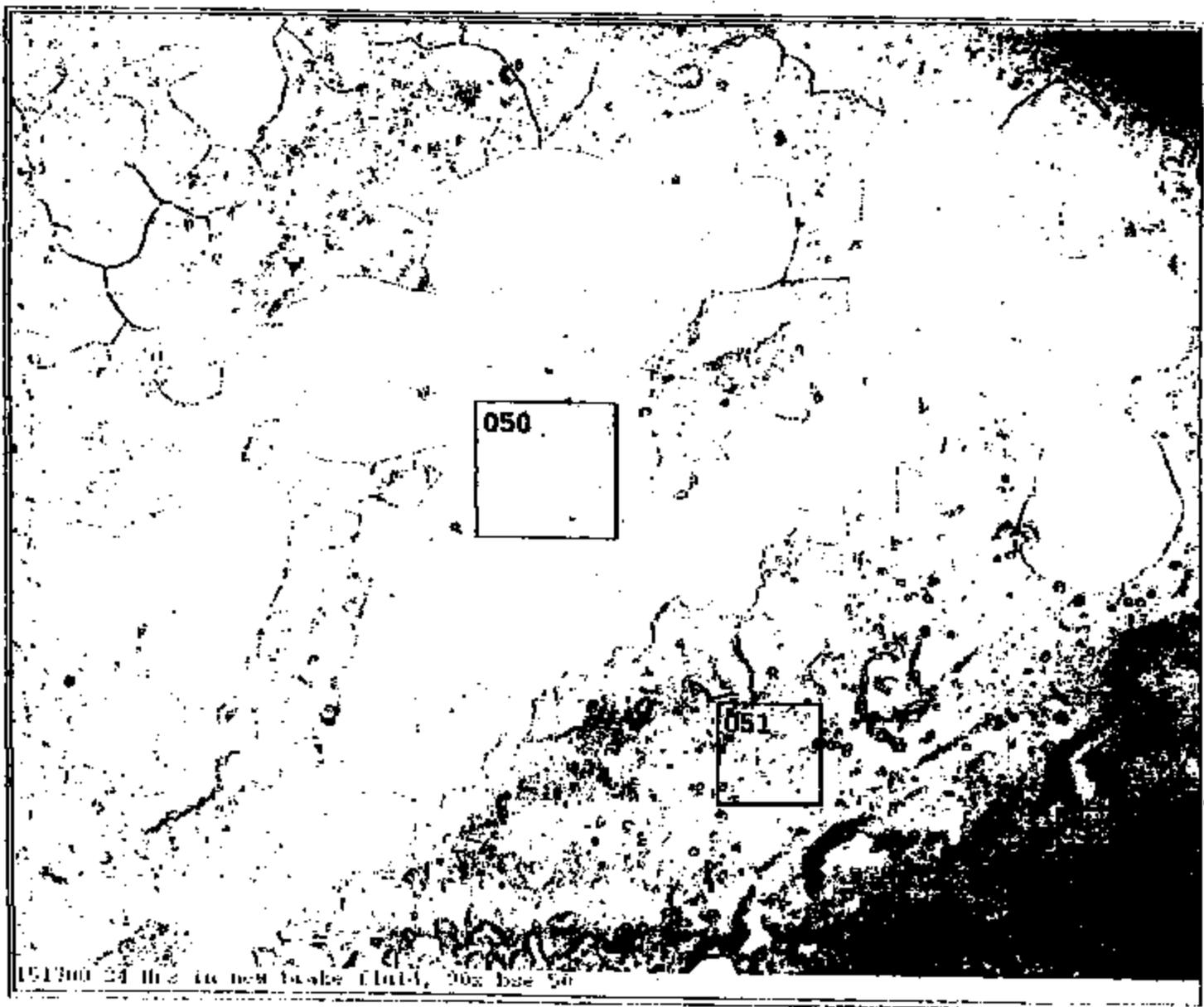


TI-NHTSA 9841

TI-NHTSA 9842



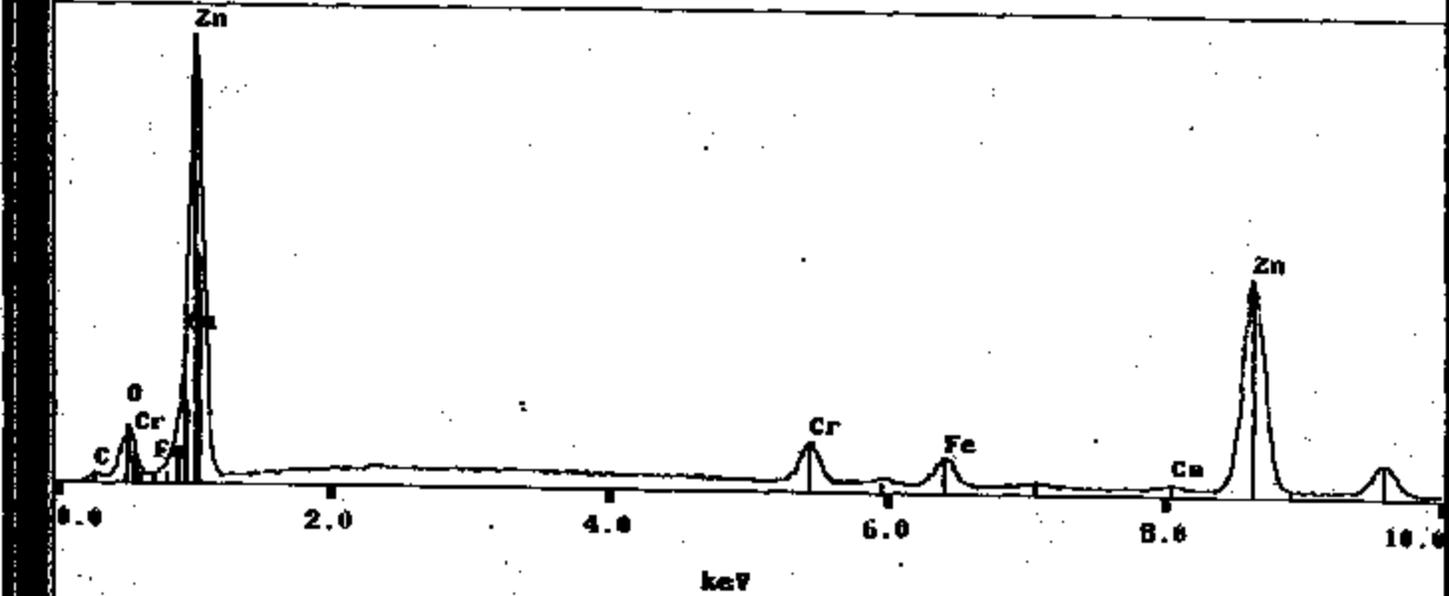
TI-NHTSA 9843



Acquisition completed.

✓ mulligan\_151700\_050 24 hrs new brake fluid

10891 FS

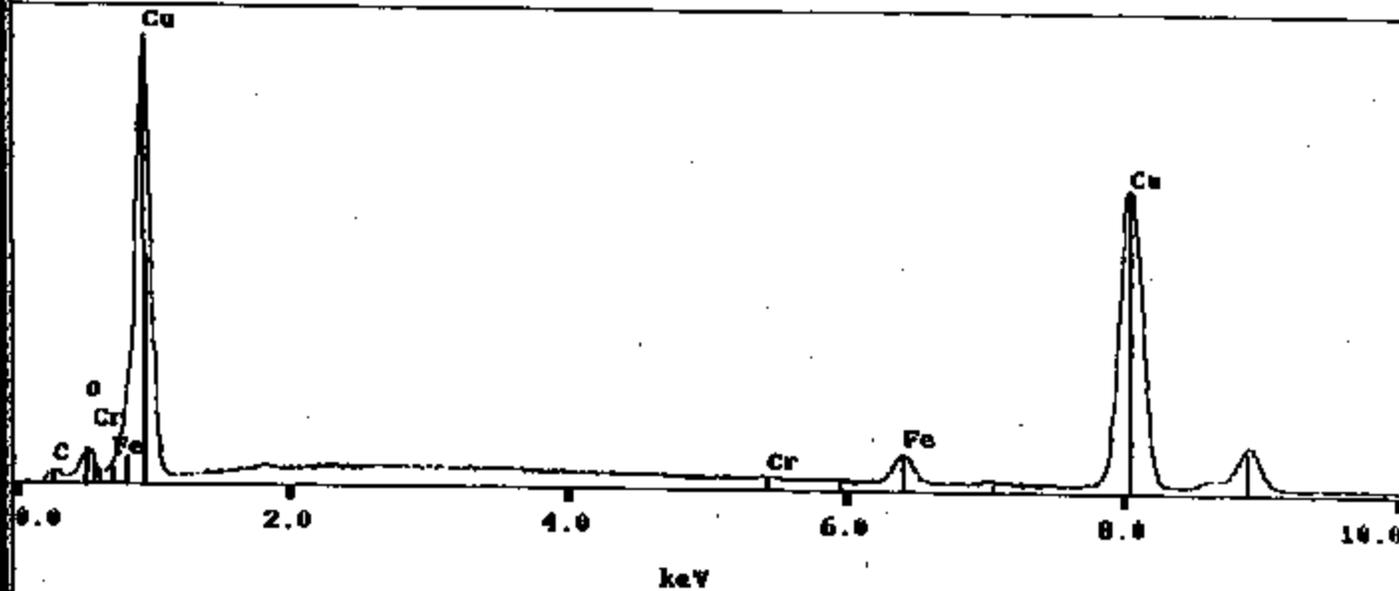


TIANTSA 9844

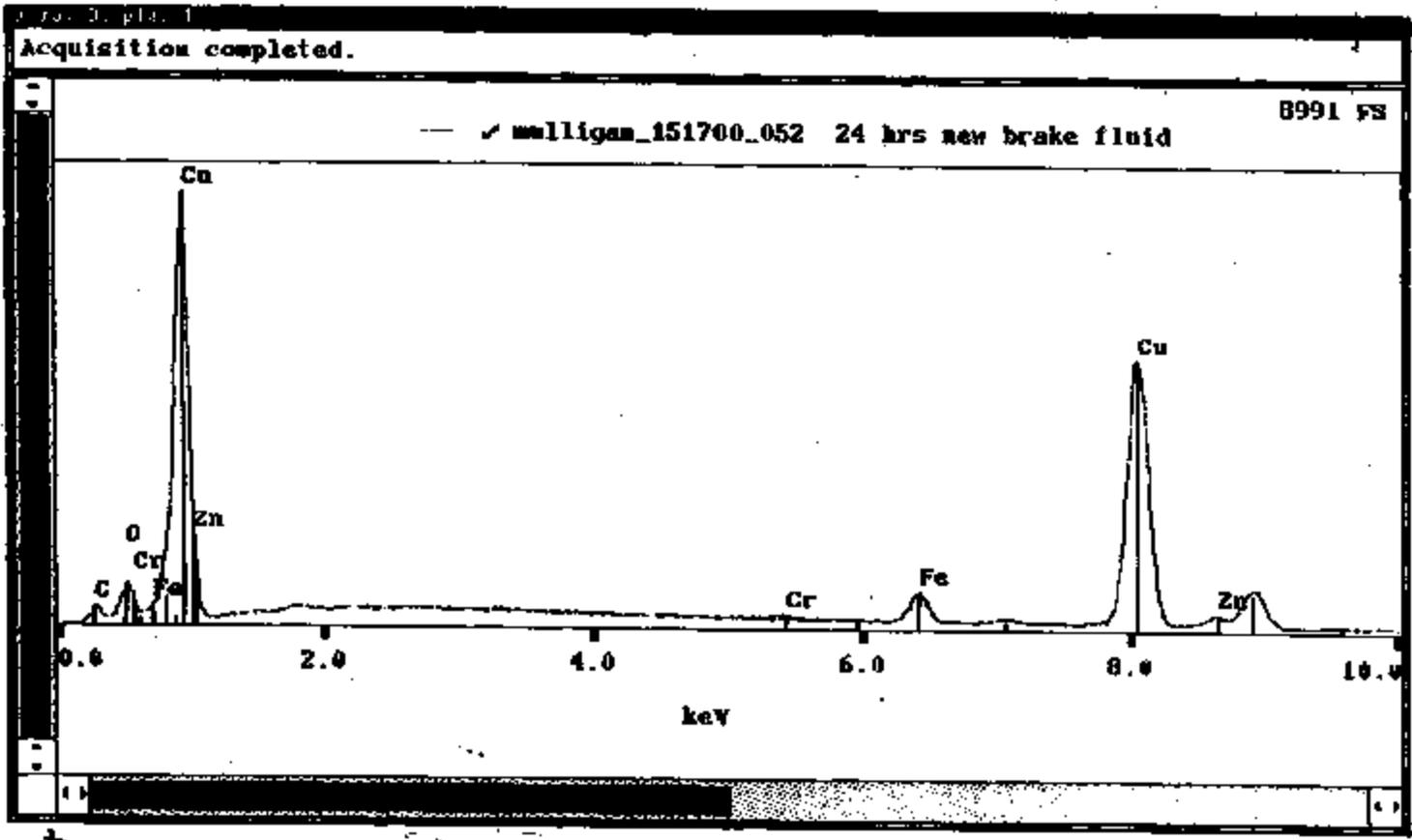
Acquisition completed.

✓ mulligan\_151700\_051 24 hrs new brake fluid

10495 FS

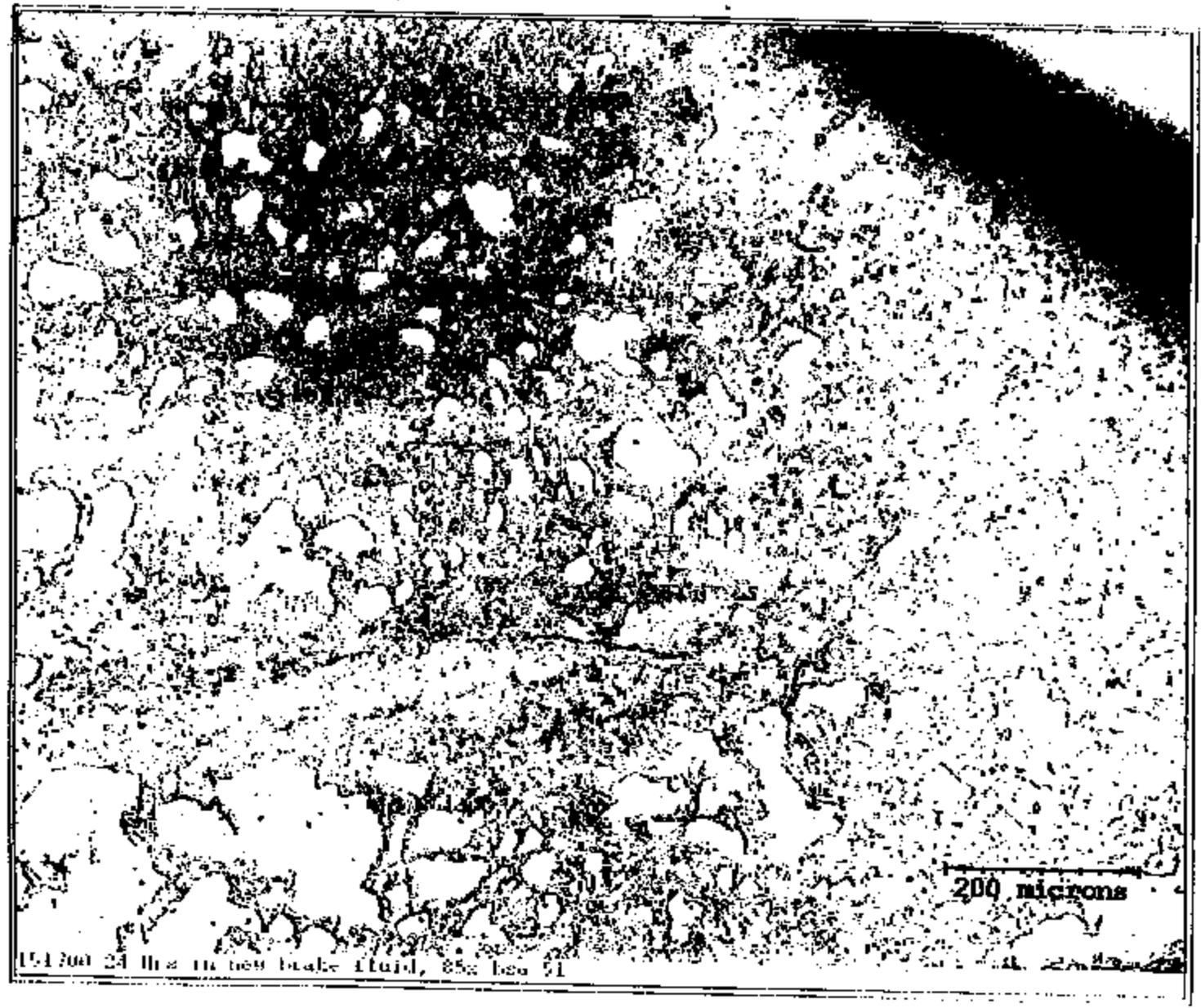


TI-NHTGA 8845



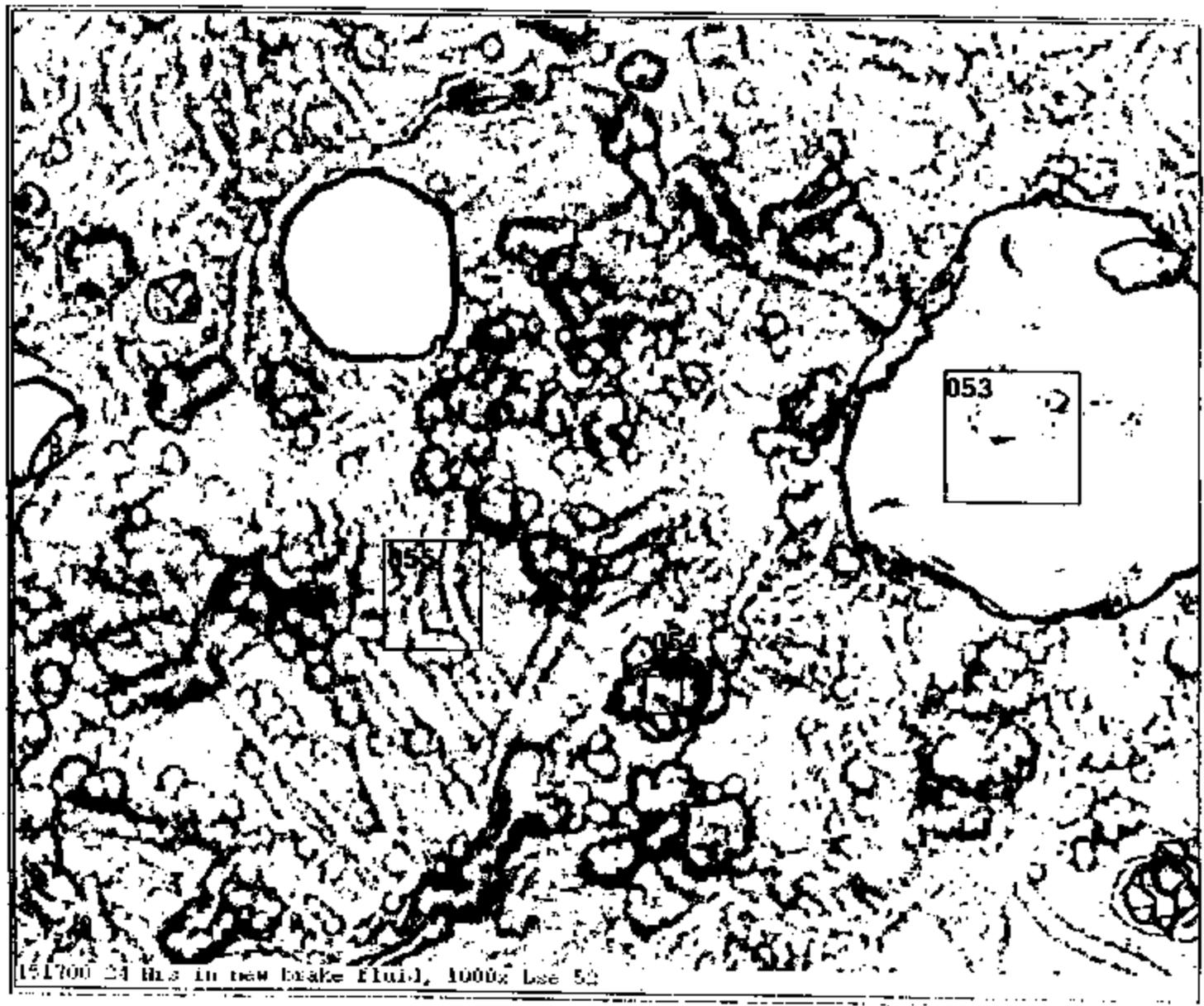
TI-NHTSA 8846

TI-NHTSA 98A7



U1700 24 hrs in new brake fluid, 85% loss

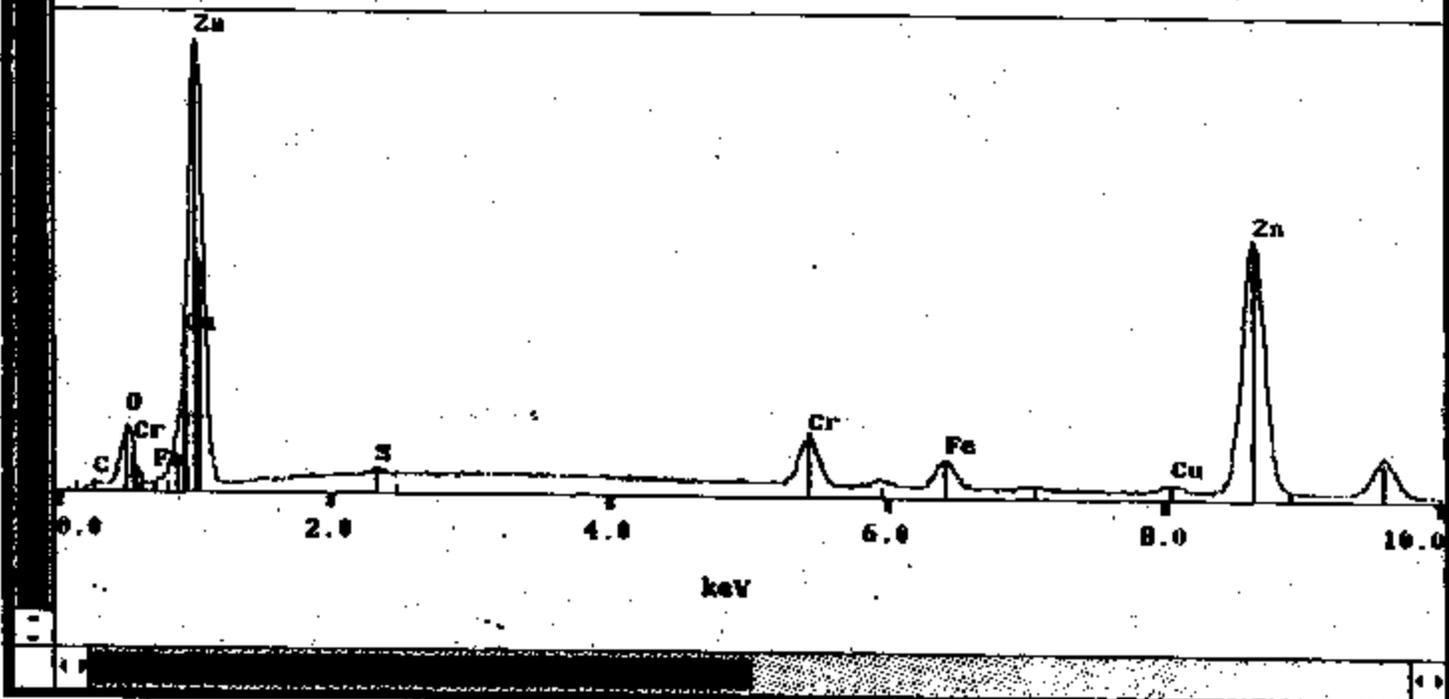
TI-NHTSA 9949



Acquisition completed.

✓ walligan\_151700\_053 24 hrs new brake fluid

10102 FS

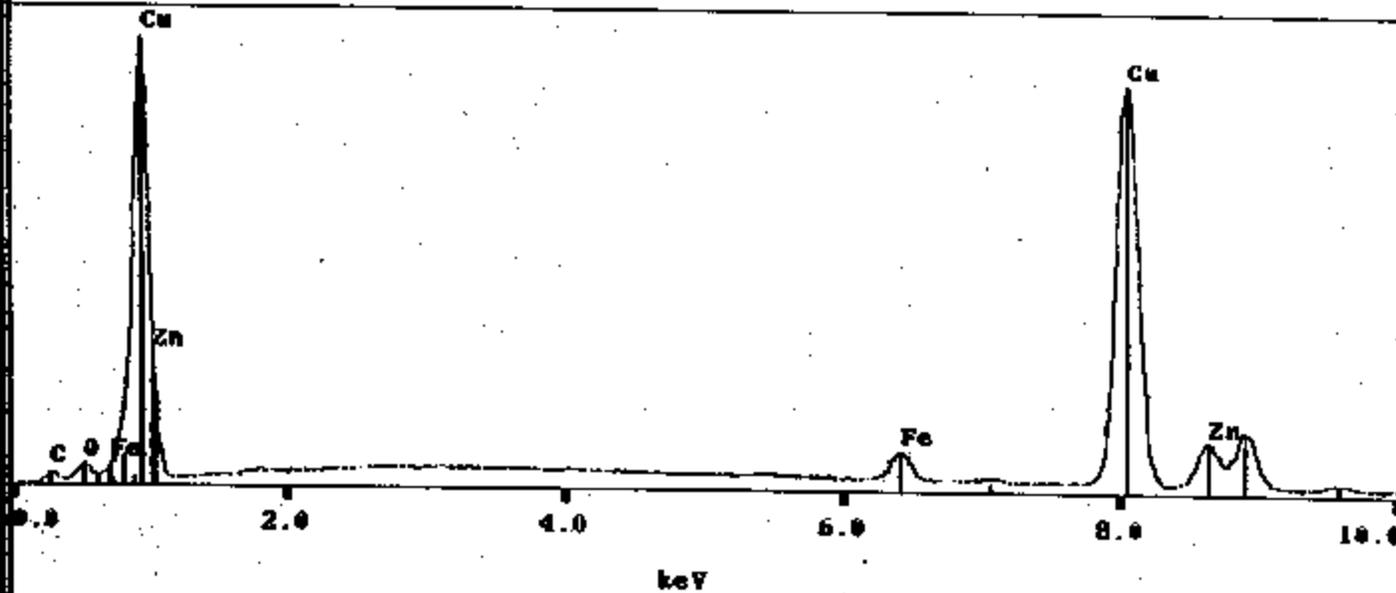


TI-NHTSA 0049

Acquisition completed.

✓ mulligan\_151700\_054 24 hrs new brake fluid

13327 FS

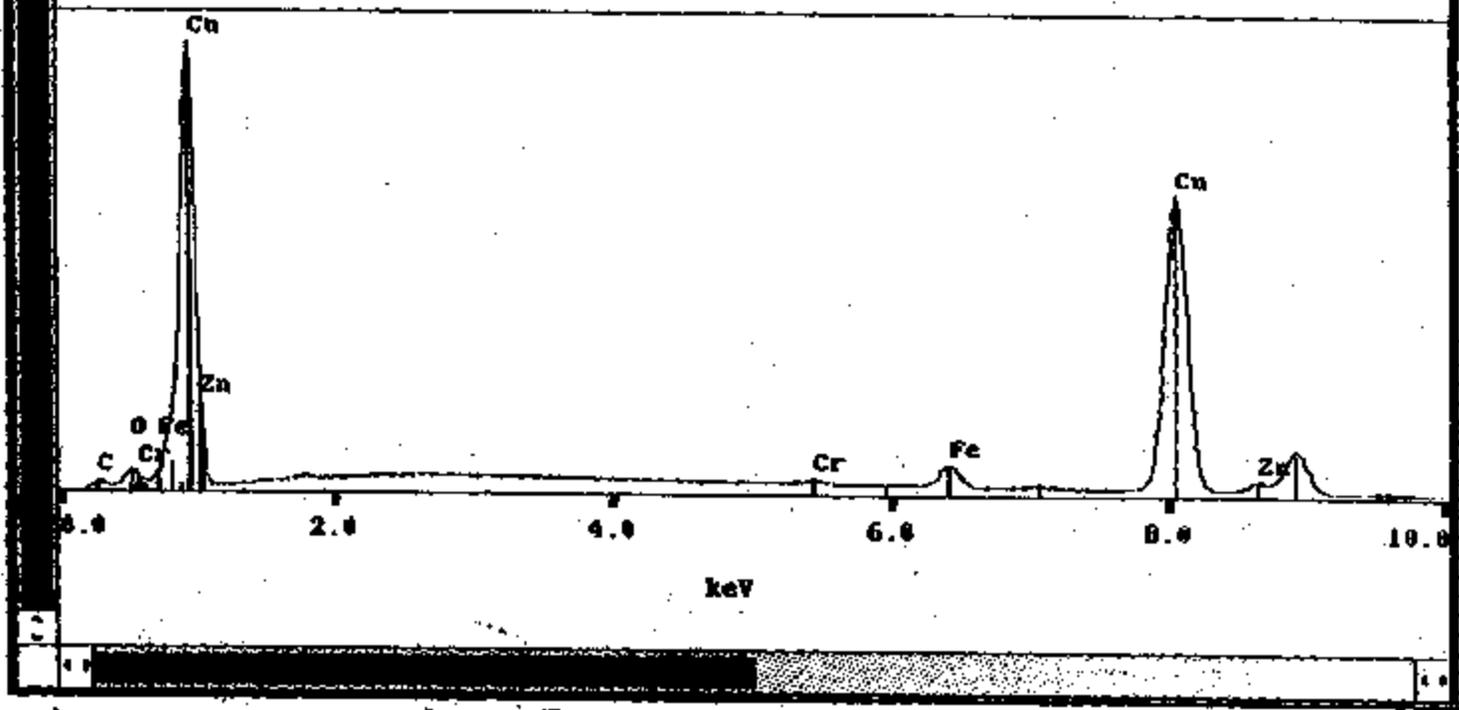


TI-NHTSA 8880

Acquisition completed.

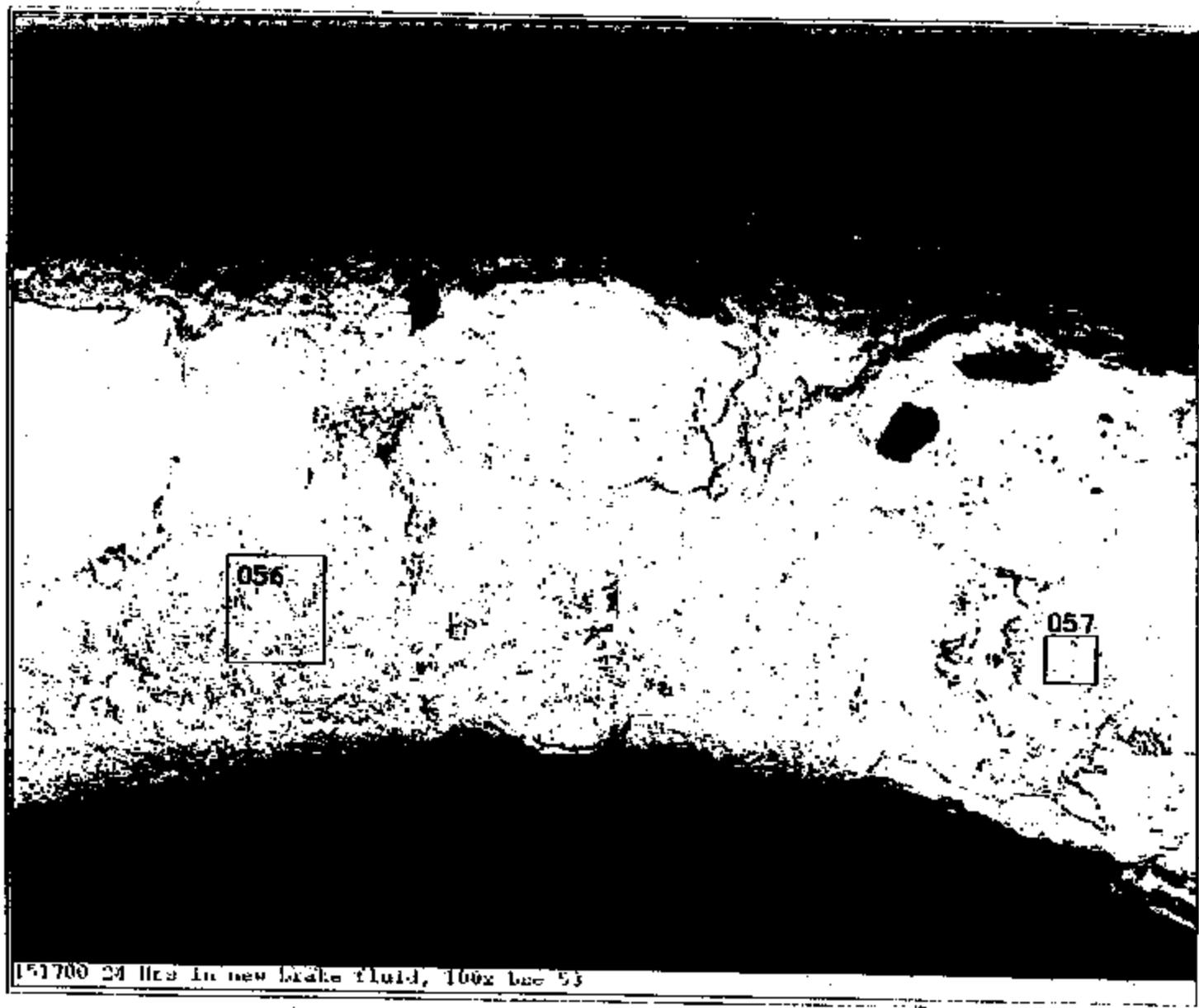
19147 FS

✓ mulligan\_151700\_055 24 hrs new brake fluid



TI-NHTSA 9851

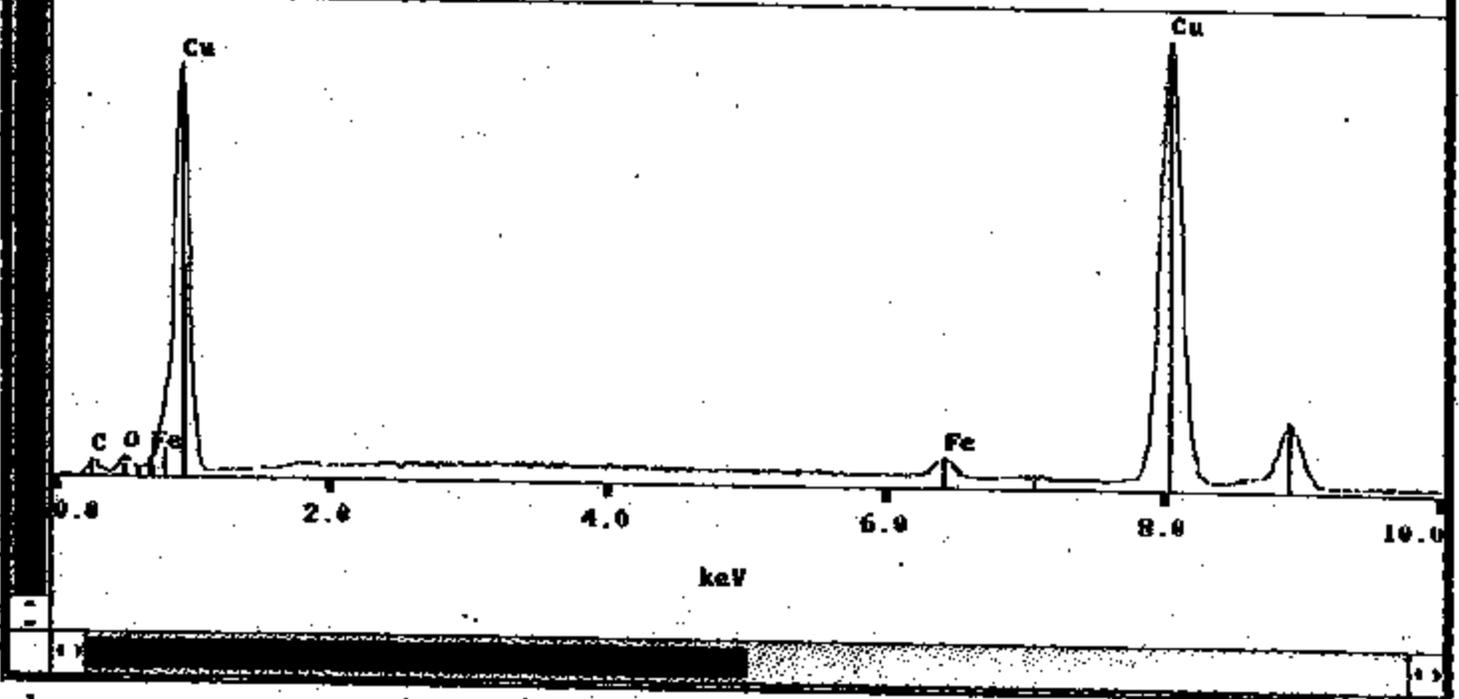
TI-NHTSA 9852



Acquisition completed.

✓ mulligan\_151700\_056 24 hrs new brake fluid

9290 FS

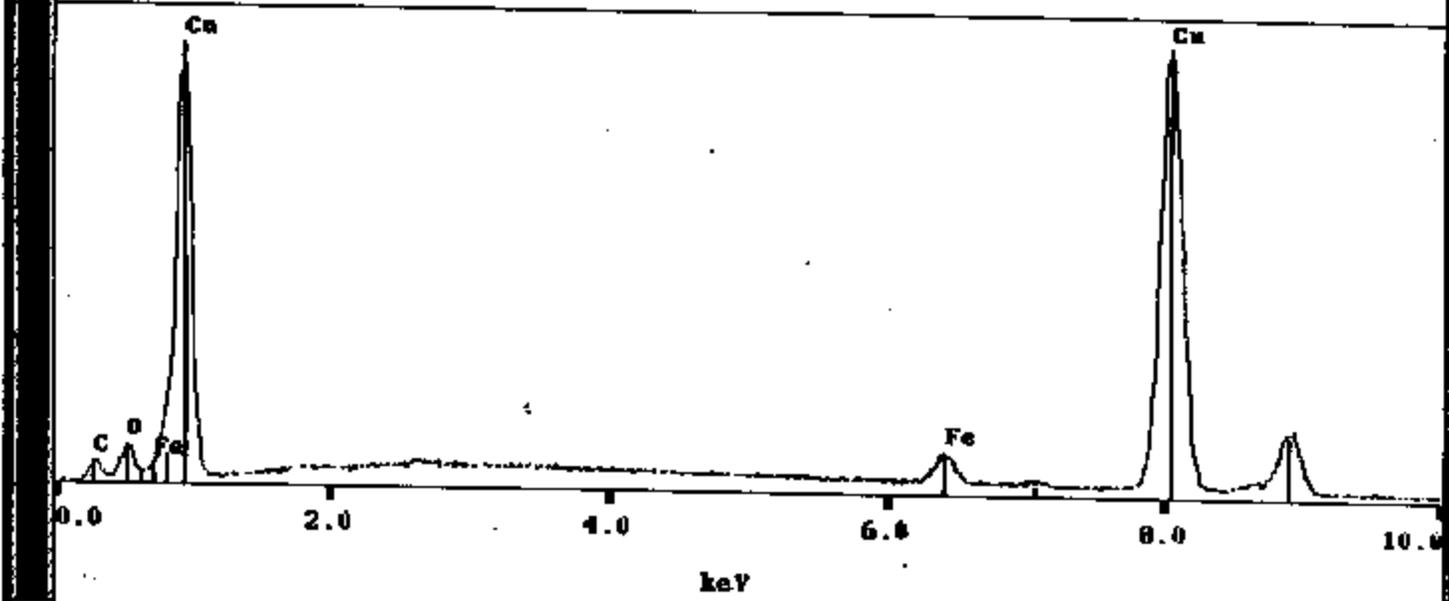


TI-NHTSA 9853

Acquisition completed.

✓ wulligan\_151700\_057 24 hrs new brake fluid

7434 FS



TI-NHTSA 9854



10 microns

151700 24 Hrs Used Brake fluid cup 63

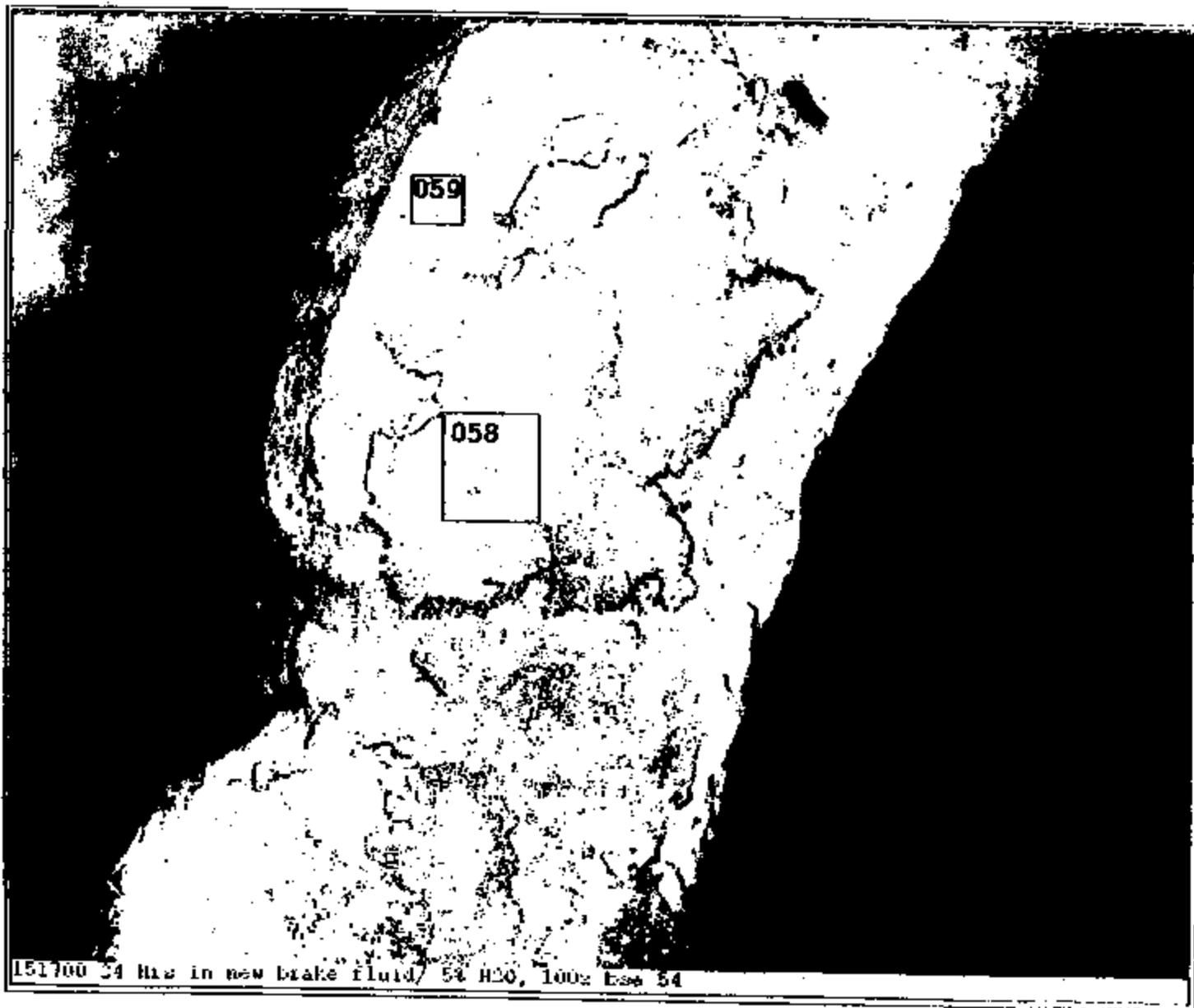
TI-NHTSA 9555

TI-NHTSA 0856



151700 24 Hrz Used Brake Fluid cup 64

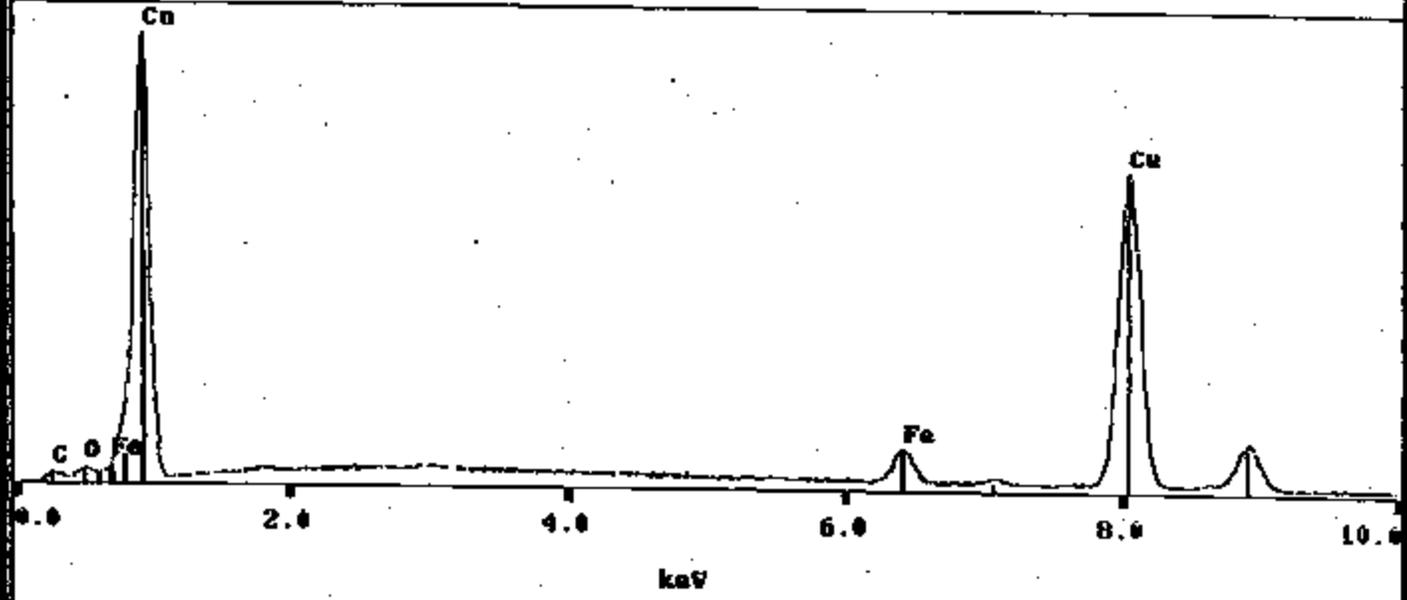
TIAMHTSA 9857



Acquisition completed.

✓ mulligan\_151700\_058 24 hrs new brake fluid, 5% H2O

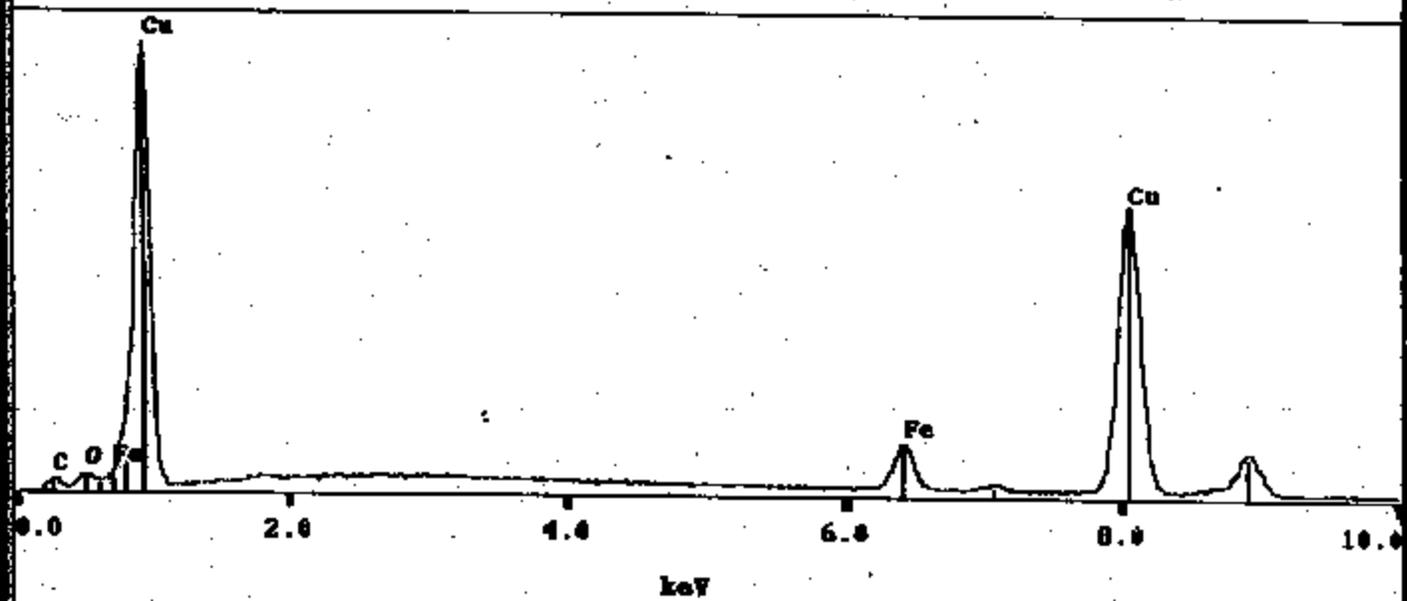
11226 FS



TI-NHTSA 9858

Acquisition completed.

✓ mulligan\_151700\_059 24 hrs new brake fluid, 5% X20 9740 FS



TI-NHTSA 0889

TI-NHTSA 9880

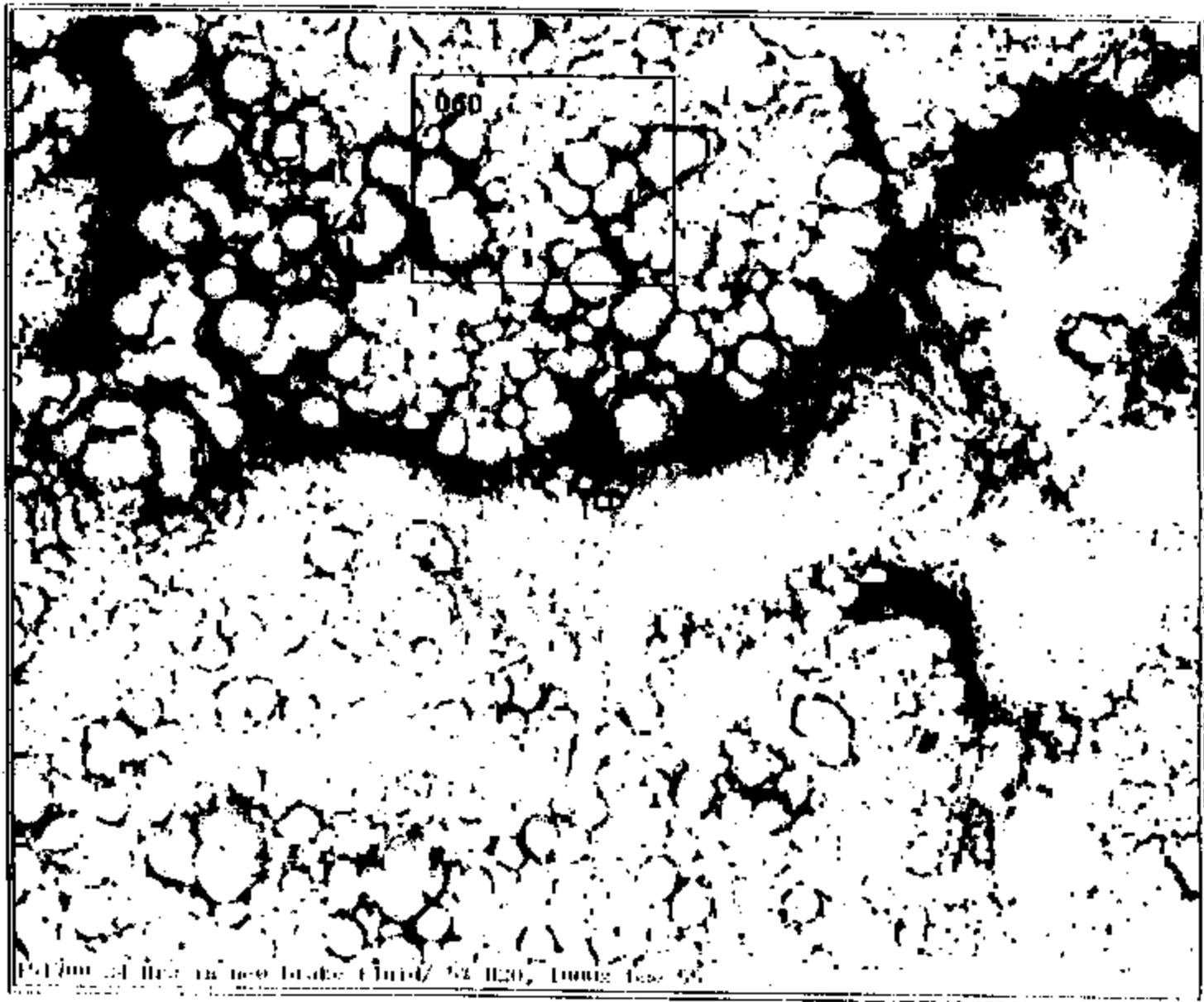
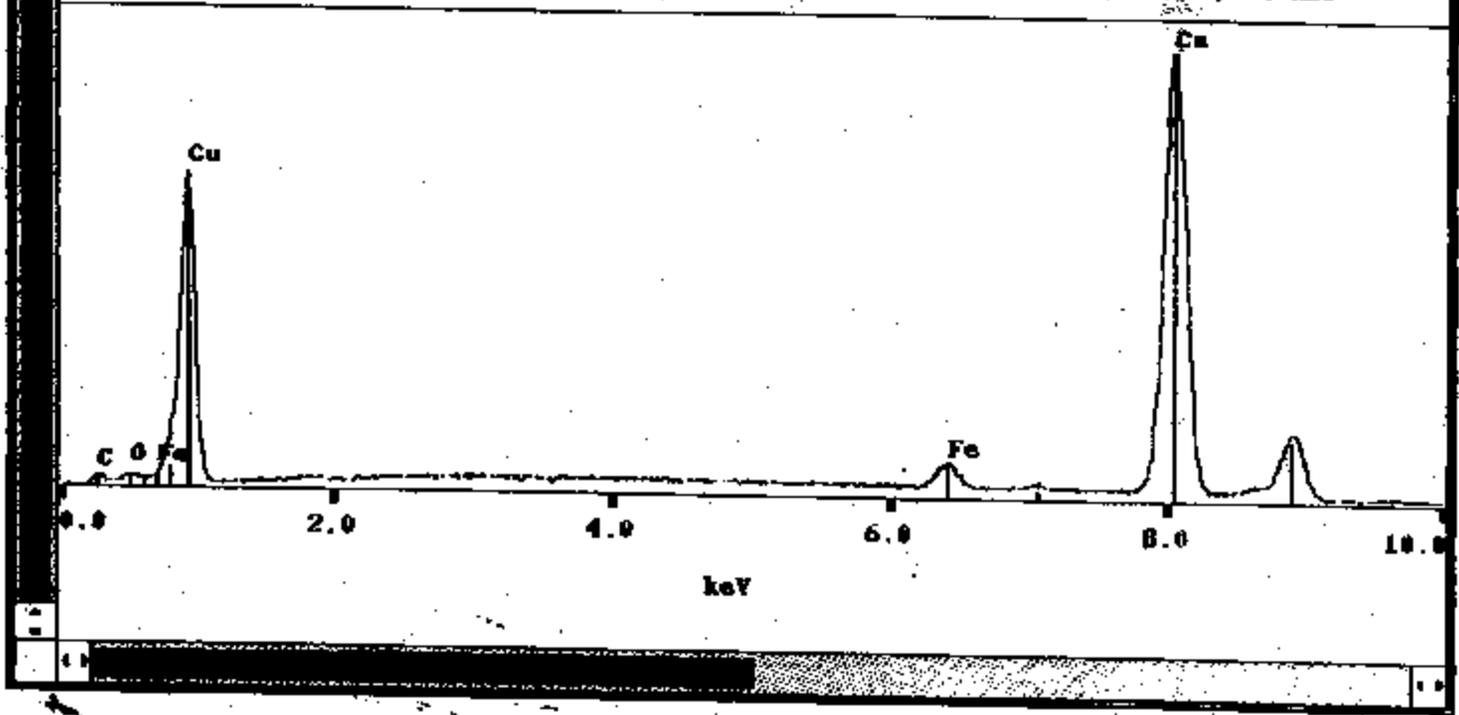


Figure 1. Micrograph showing a dense field of small, rounded, light-colored structures, likely cells or spores, arranged in a somewhat regular pattern. A scale bar in the upper left corner indicates 0.60 units.

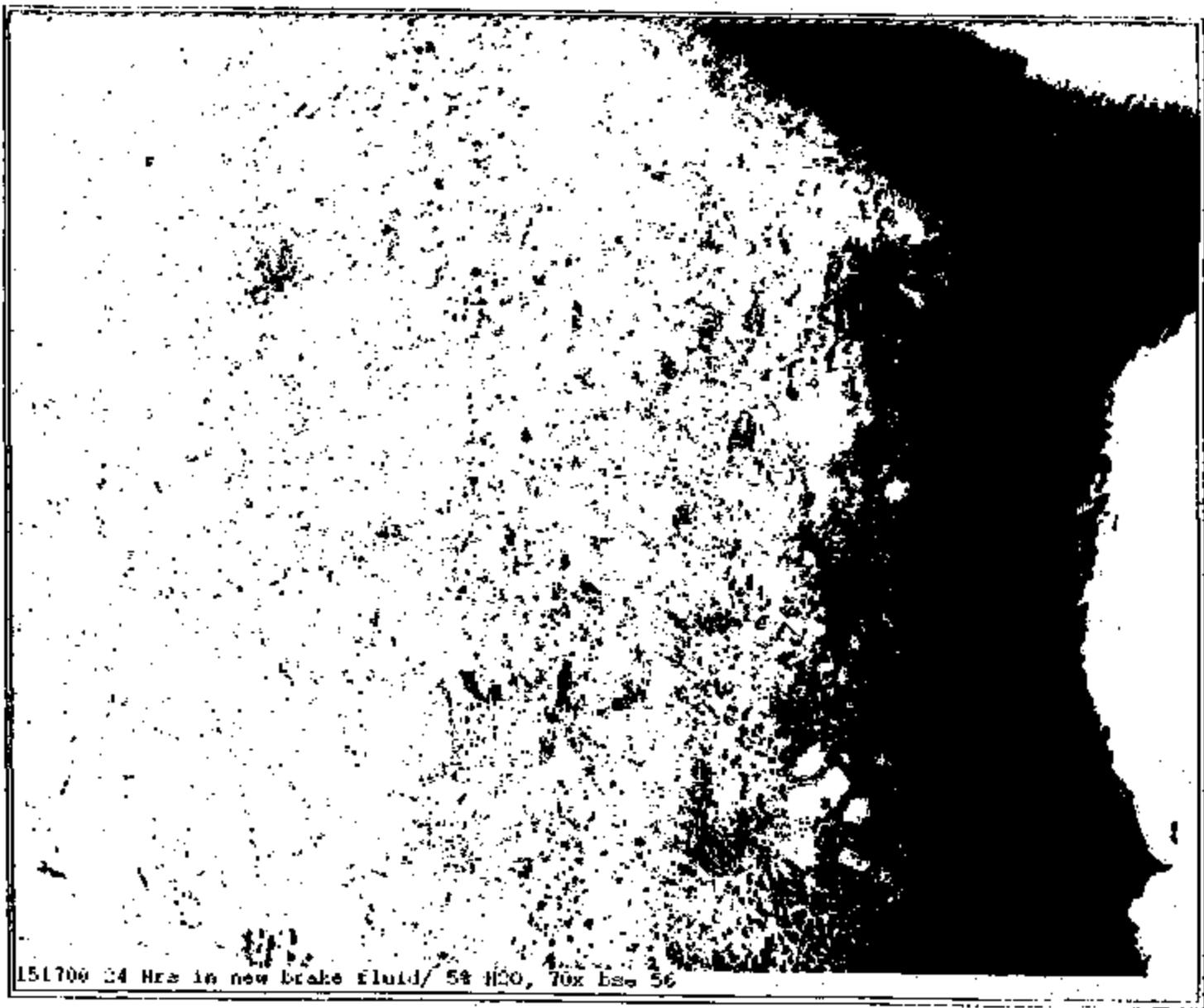
Acquisition completed.

✓ mulligan\_151700\_060 24 hrs new brake fluid, 5% H2O 7022 FS



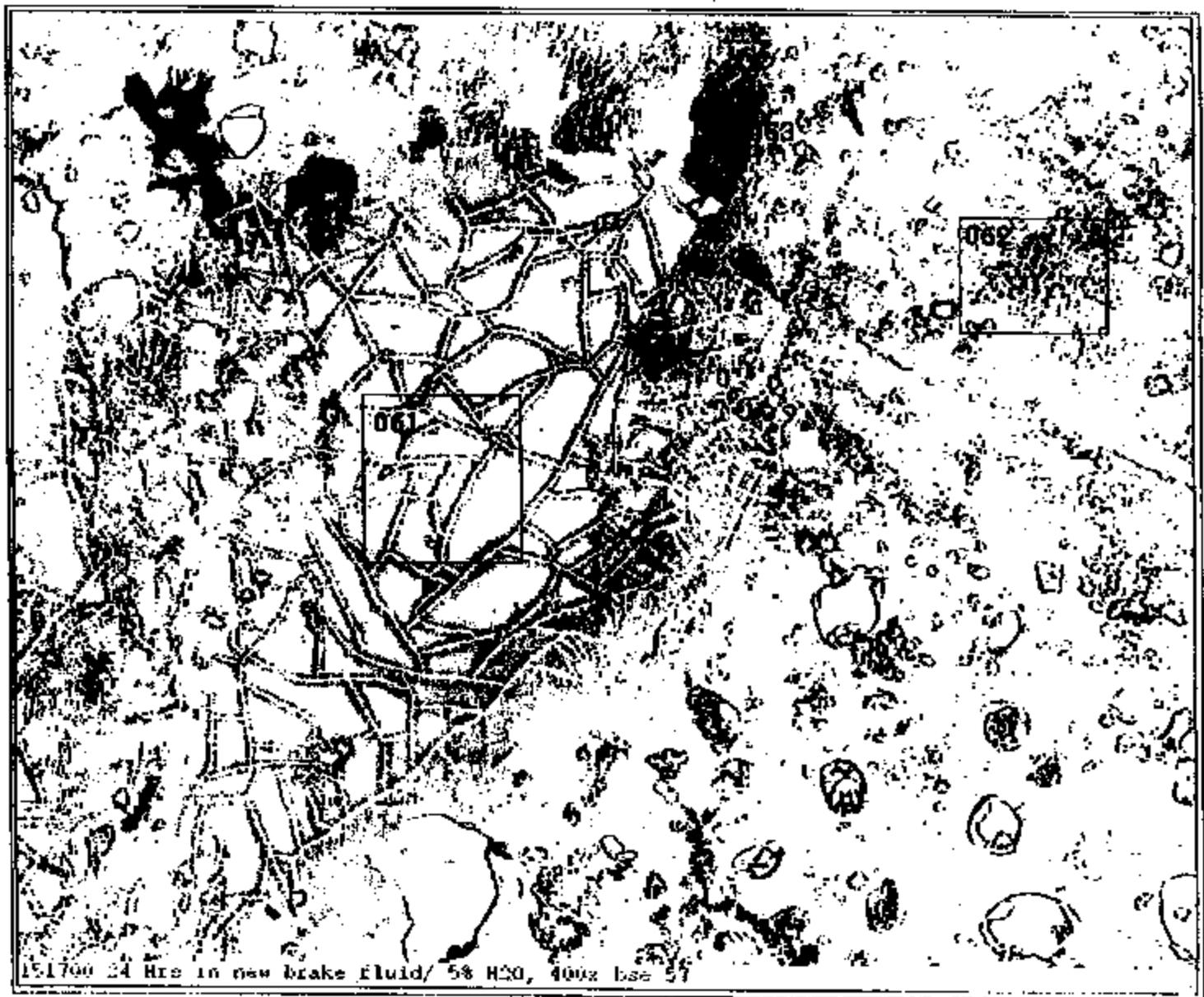
TI-NHTSA 9801

TI-NHTSA 9862



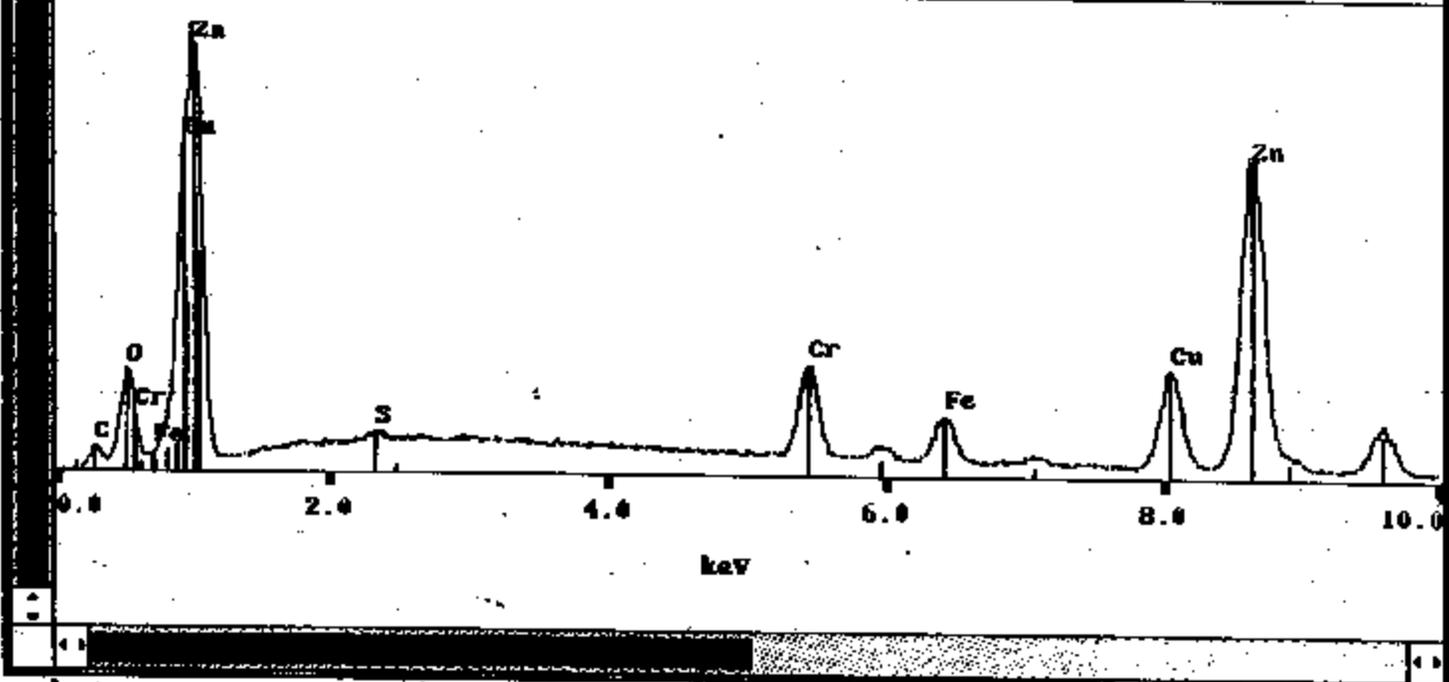
151700 24 Hrs in new brake fluid/ 5% H<sub>2</sub>O, 70x hse 56

TI-NHTSA 9963



Acquisition completed.

✓ mulligan\_151700\_061 24 hrs new brake fluid, 5% M20 6663 FS

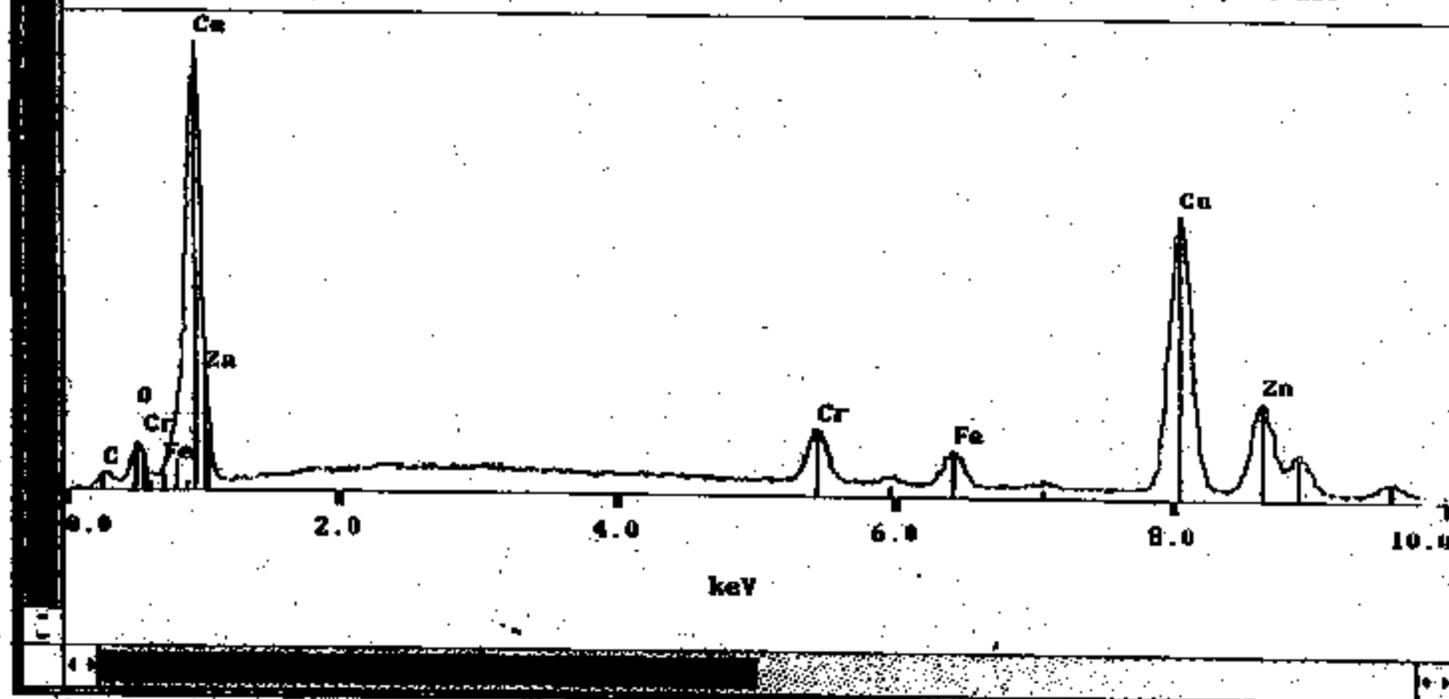


7088 9884

Acquisition completed.

✓ milligan\_151700\_062 24 hrs new brake fluid, 5% N20

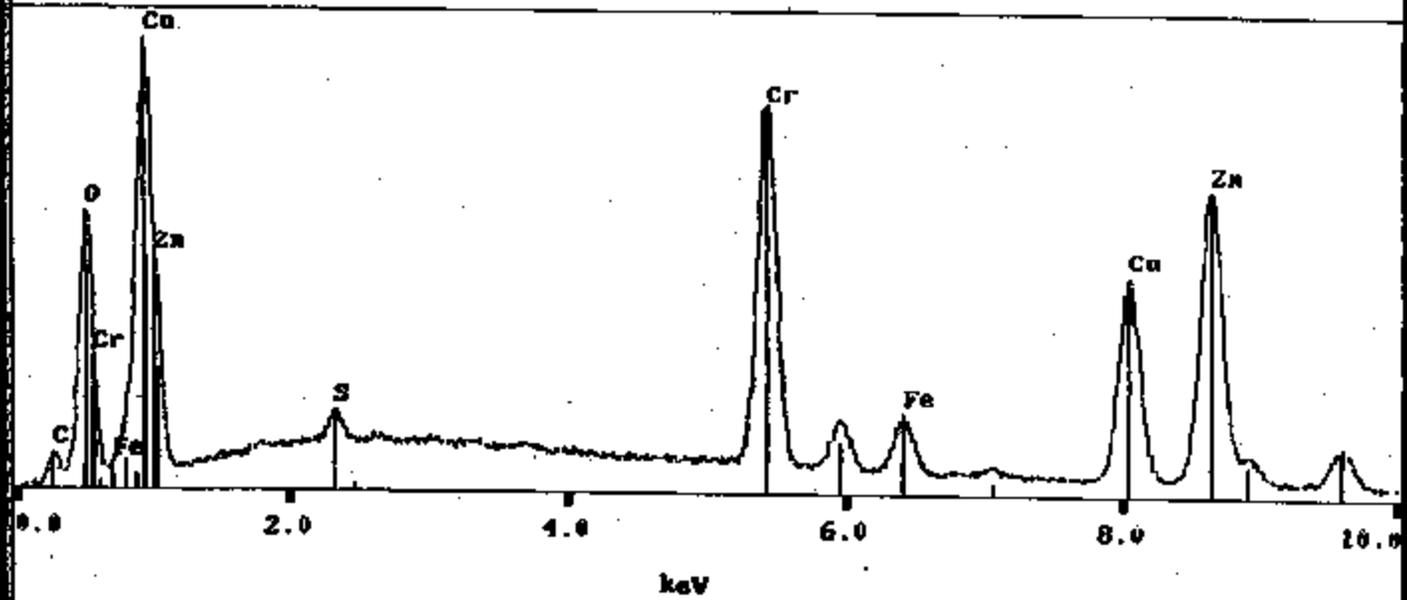
6980 FS



TI-NHTSA 9868

Acquisition completed.

✓ mulligan\_151700\_063 24 hrs new brake fluid, 5% M20 4567 FS



TI-NHTSA 9866

TL-NHTSA 986

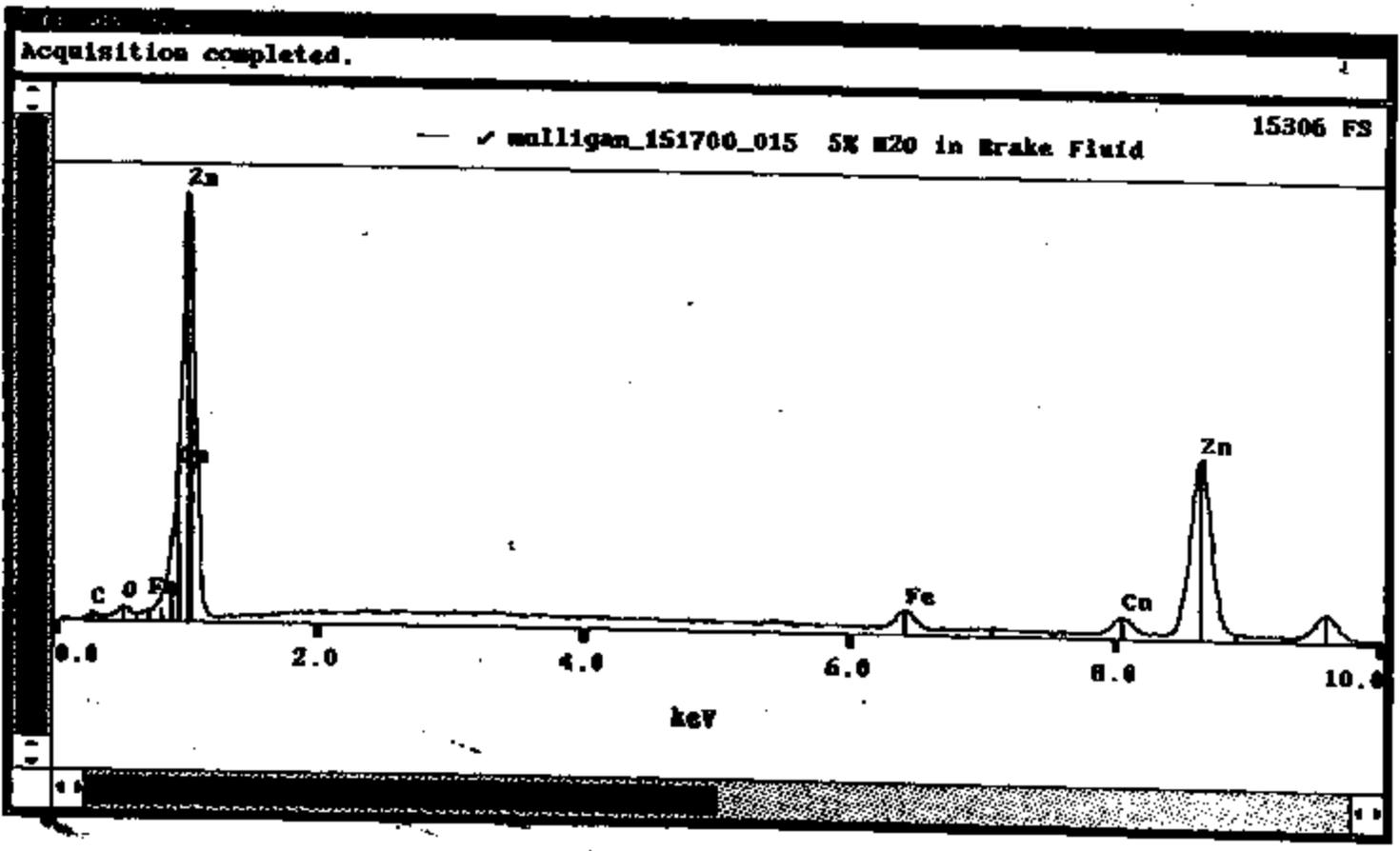


151700 54 H2O in Used Brake Fluid, 24Hrs, 25x oc 42

6086 VSLHNI1



151700 5% H2O in Used Brake Fluid, 24hrs, 25x bsa 43



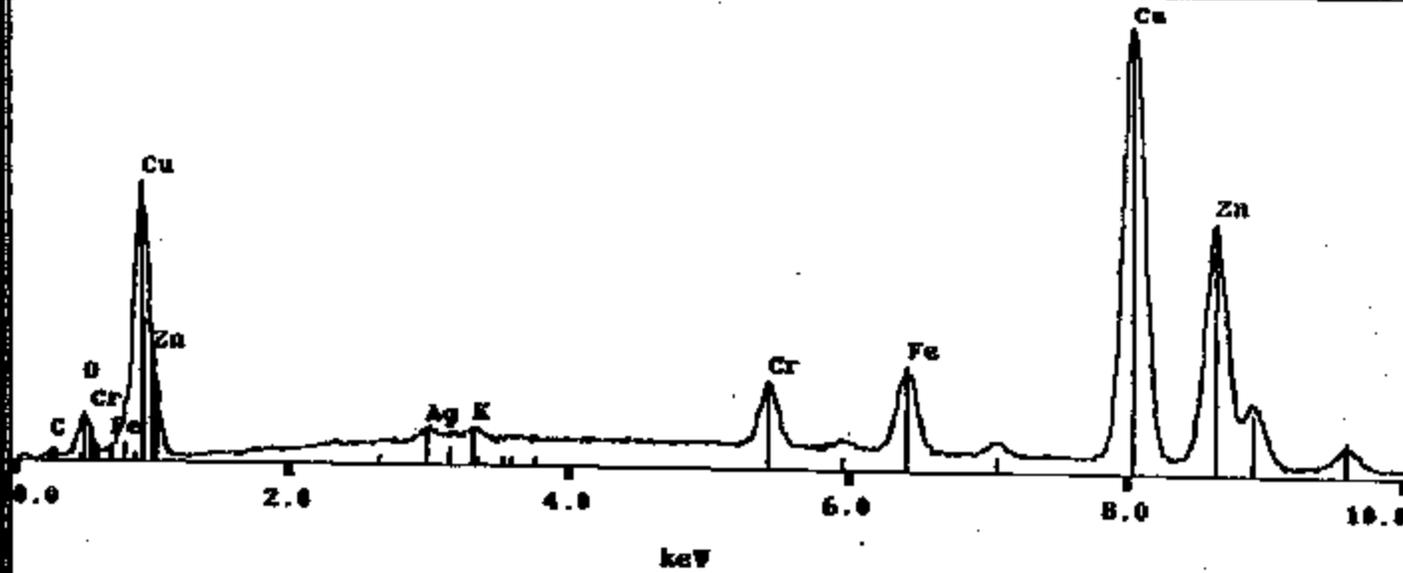
TI-NHTSA 9809



Acquisition completed.

— ✓ nulligan\_151700\_017 5% H2O in Brake Fluid

0110 FS



TI-NHTSA 9871

TIJNHTSA 9872

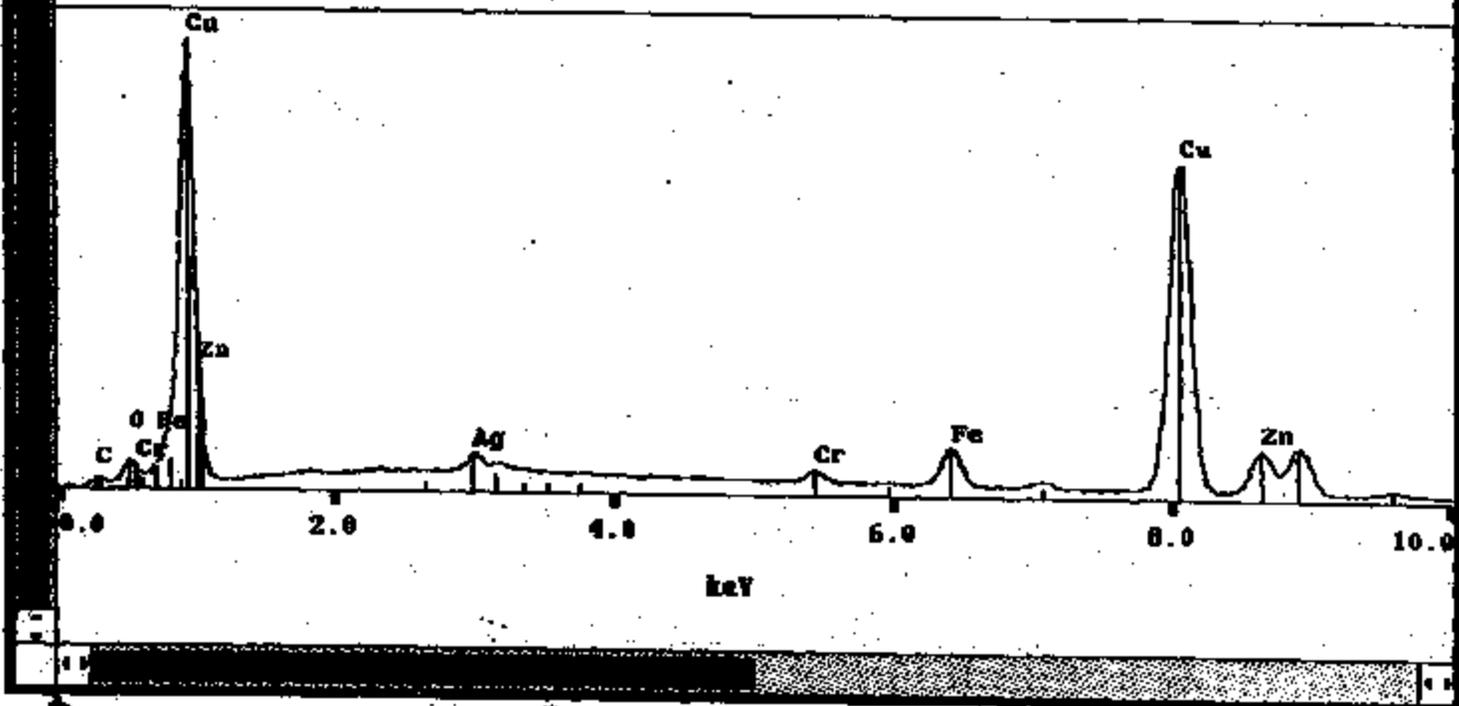


151700 5% H<sub>2</sub>O in Used Brake Fluid, 24Hrs, 750x se 44, area of 017 spectra

Acquisition completed.

✓ nulligan\_151700\_010 Sx M20 in Brake Fluid

22273 FS

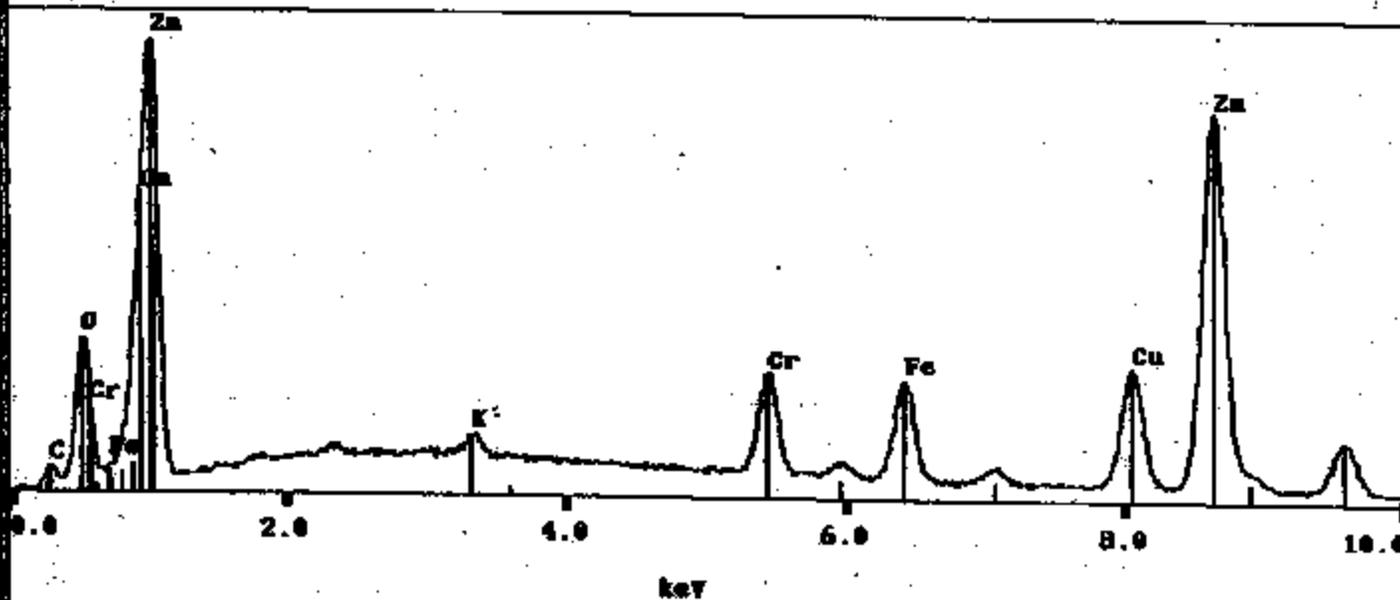


TI-NHTSA 9873

Acquisition completed.

✓ mulligan\_151700\_019 SX H2O in Brake Fluid

7134 FS

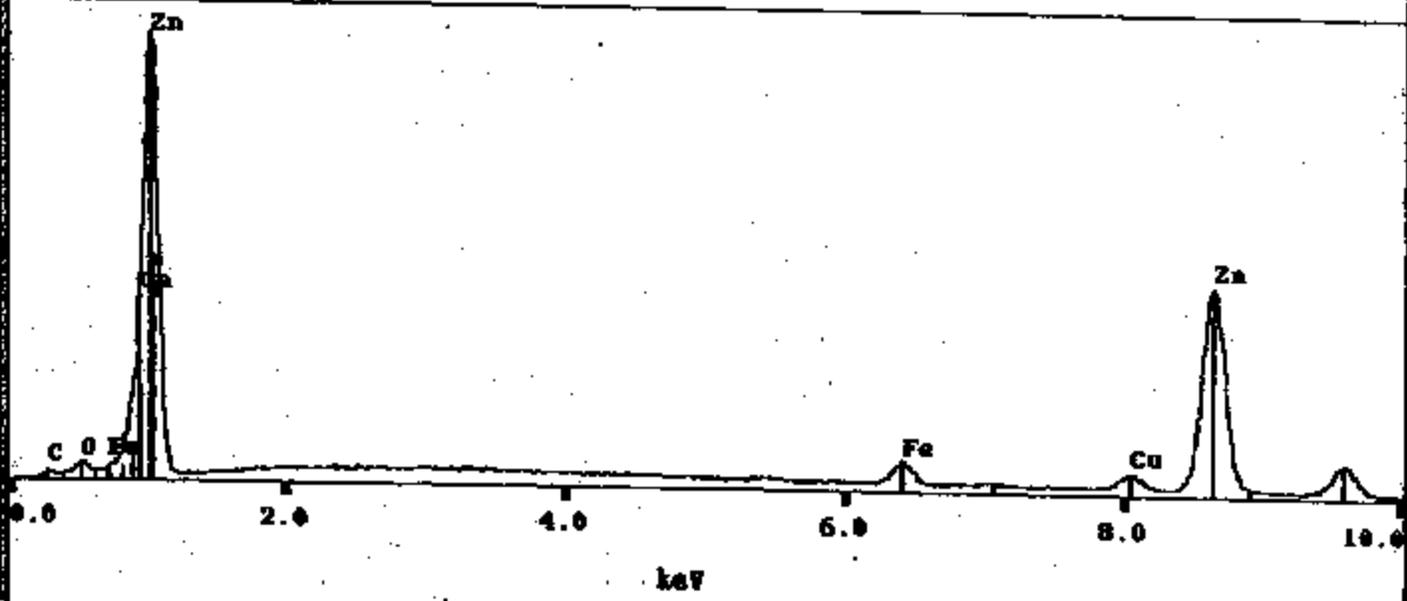


TI-NHTSA 9874

Acquisition completed.

✓ milligan\_151700\_020 5% H2O in Brake Fluid

13082 FS



TMHTSA 9875



TI-NHTSA 9876

TI-NHTSA 9877

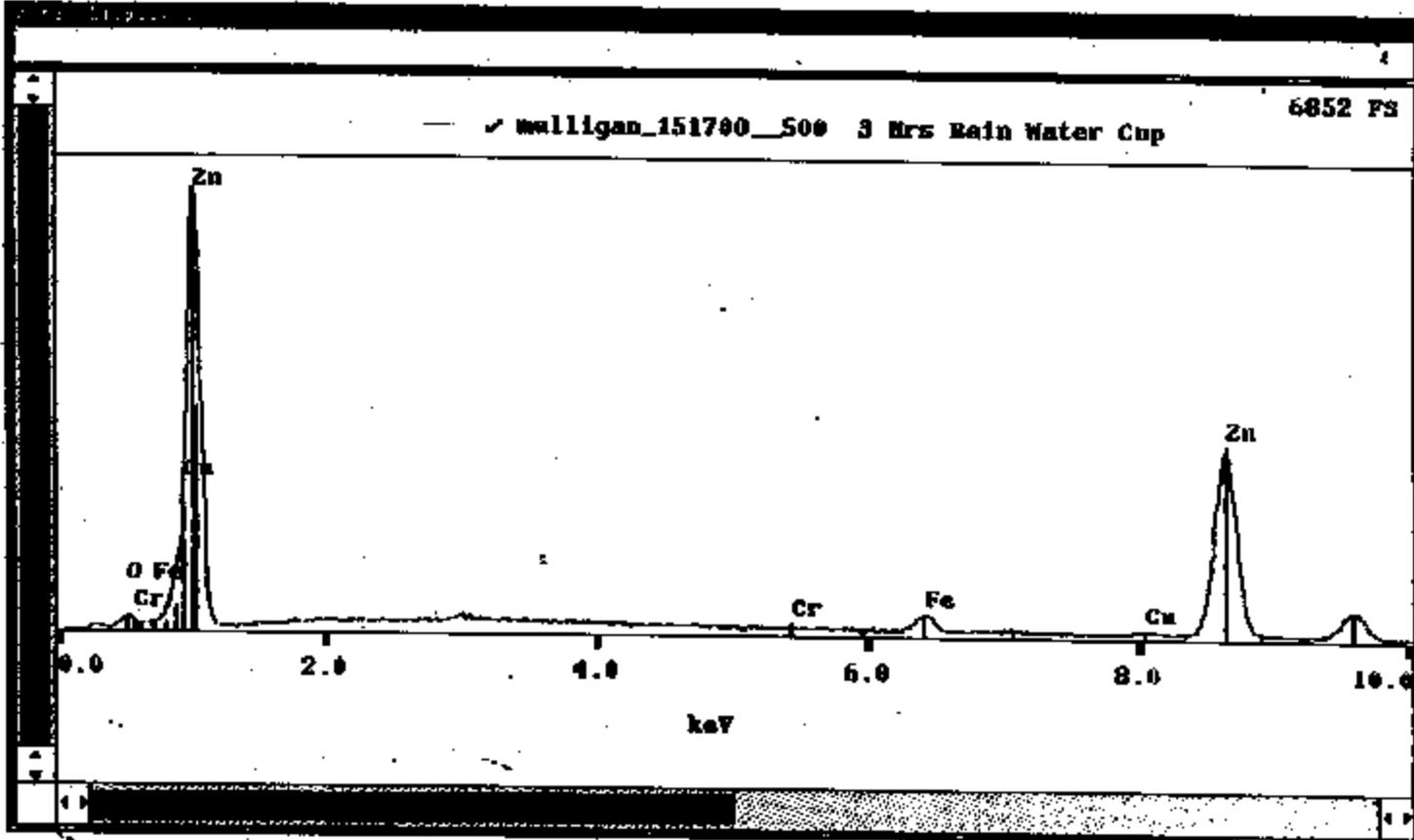


151700 - 3 Hrs Rain Water cup 50

TI-NHTSA 9879



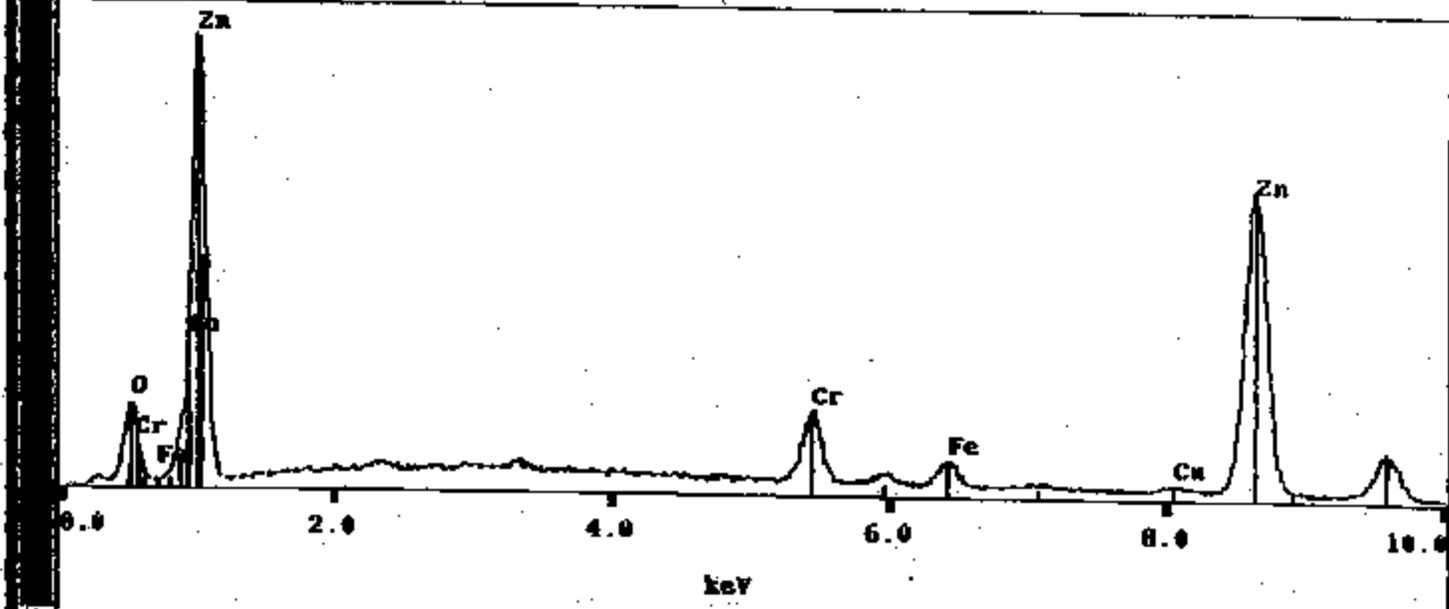
151700 S. Ho. Rain Water cup 51



TI-NHTSA 9879

✓ mulligan\_151700\_501 3 Hrs Bais Water Cup

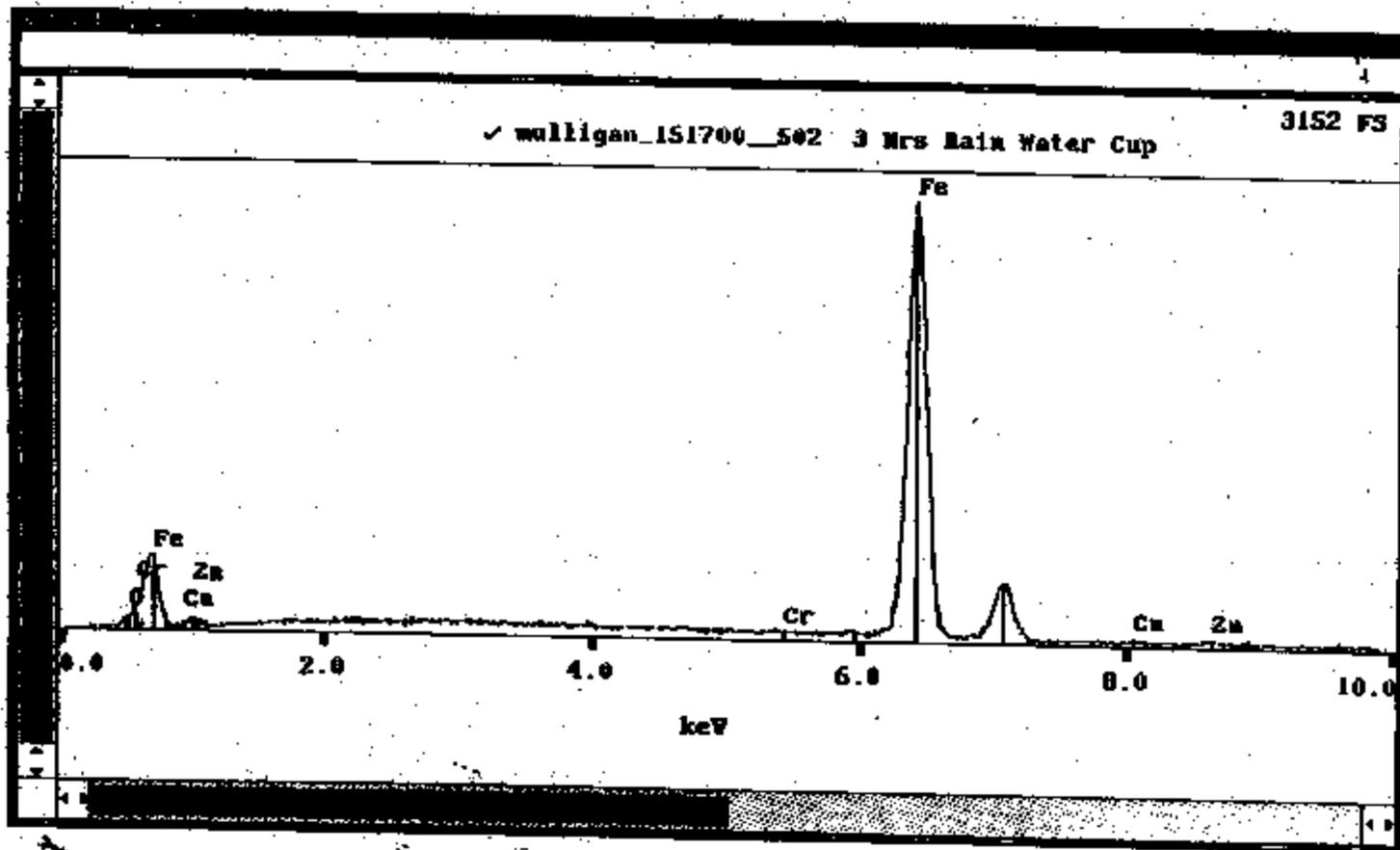
5463 FS



TI-NHTBA 9890

✓ mulligan\_151700\_502 3 Mrs Rain Water Cup

3152 FS



TLNH78A 0981



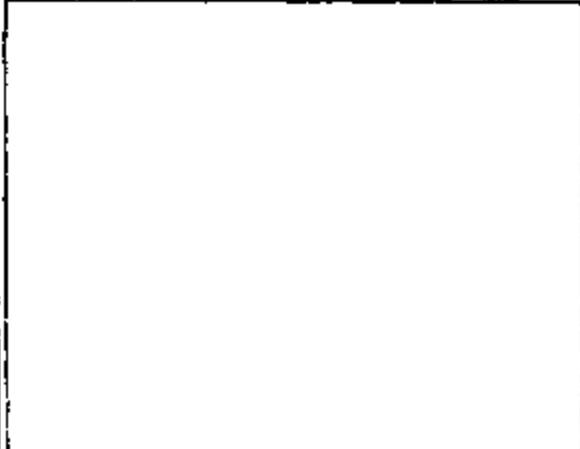
Cu K



Zn K



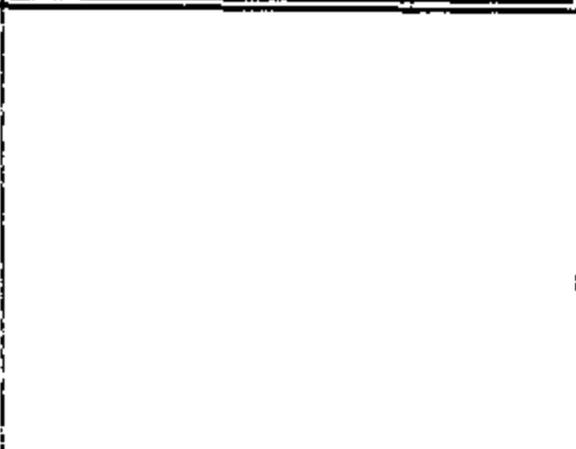
Fe K



Cr K



O K



C K



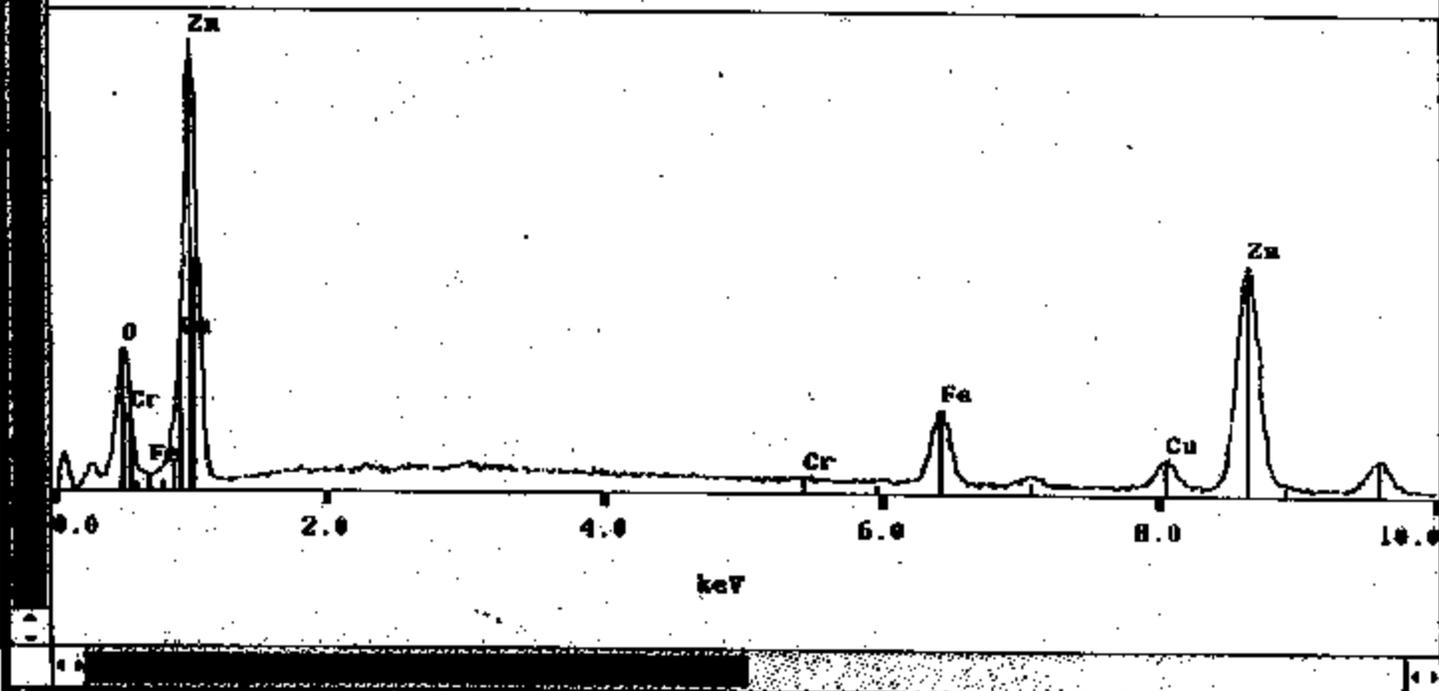
151700 3 hrs rain water

THNHTSA 0982

Acquisition completed.

✓ molligan\_151700\_504 3hrs rain Water Cap

4062 FS



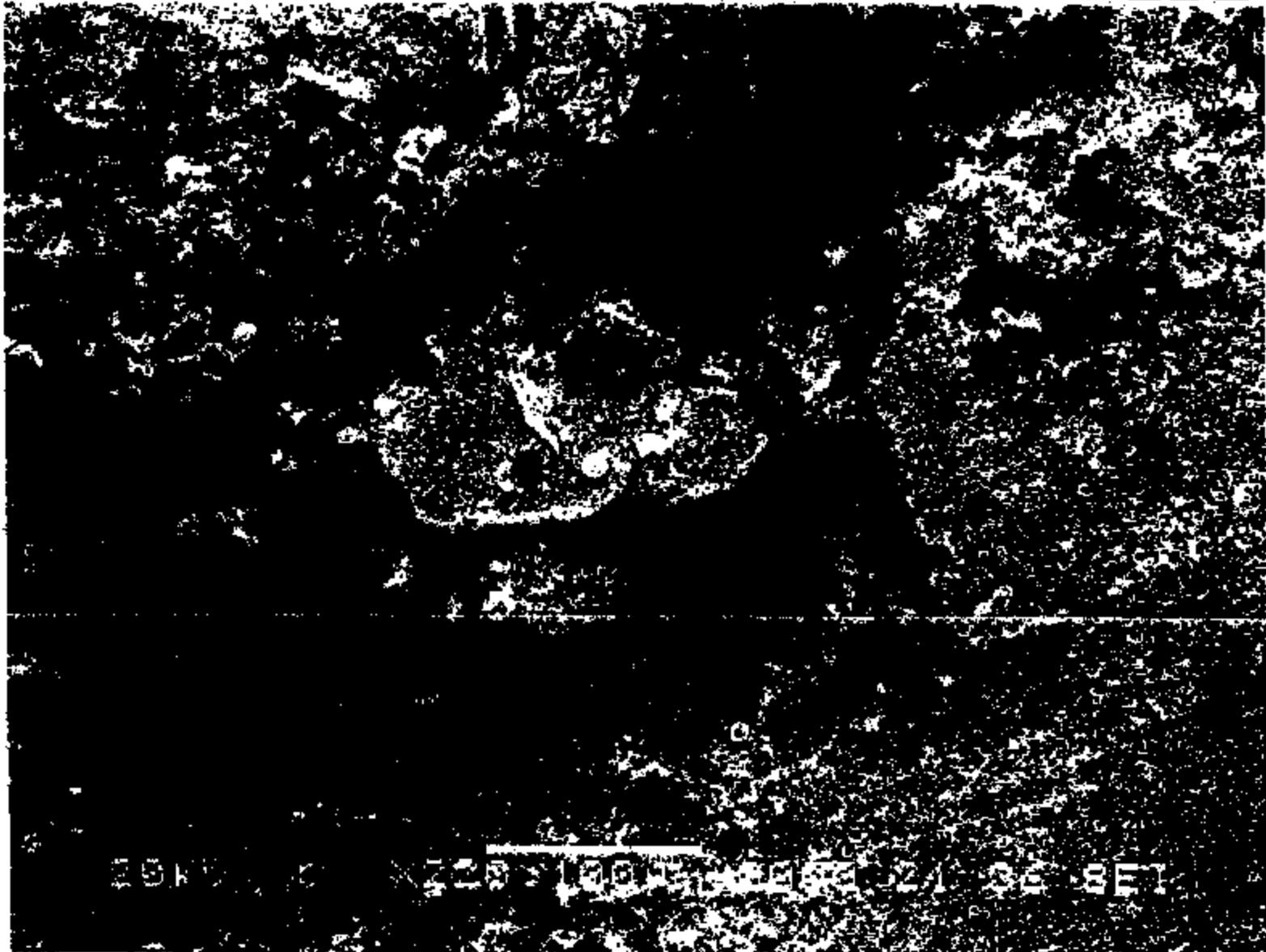
TI-NHTSA 9893

H<sub>2</sub>O

151700 Used Oil- 5%~~10%~~ Suppo

30/MAR/1999  
#3 RM17

**JEOL**

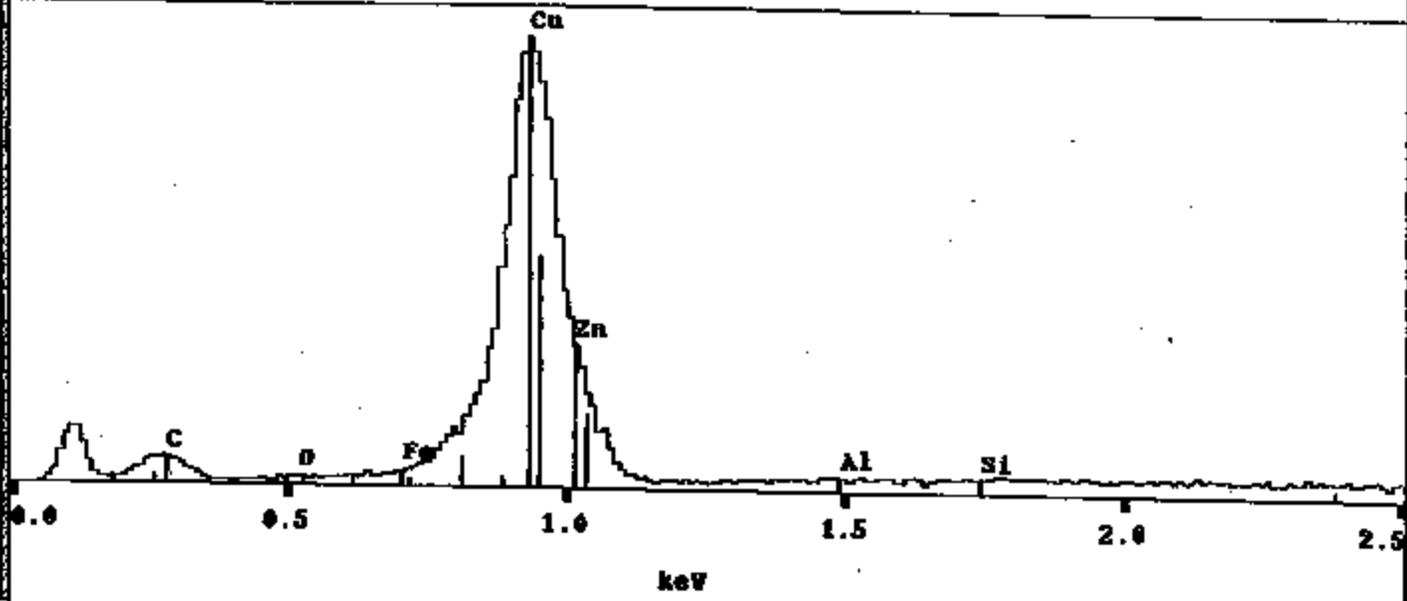


TI-NHTSA 9894

Acquisition completed.

✓ mulligan\_151700\_008 Used Brake Fluid w Water

1892 FS

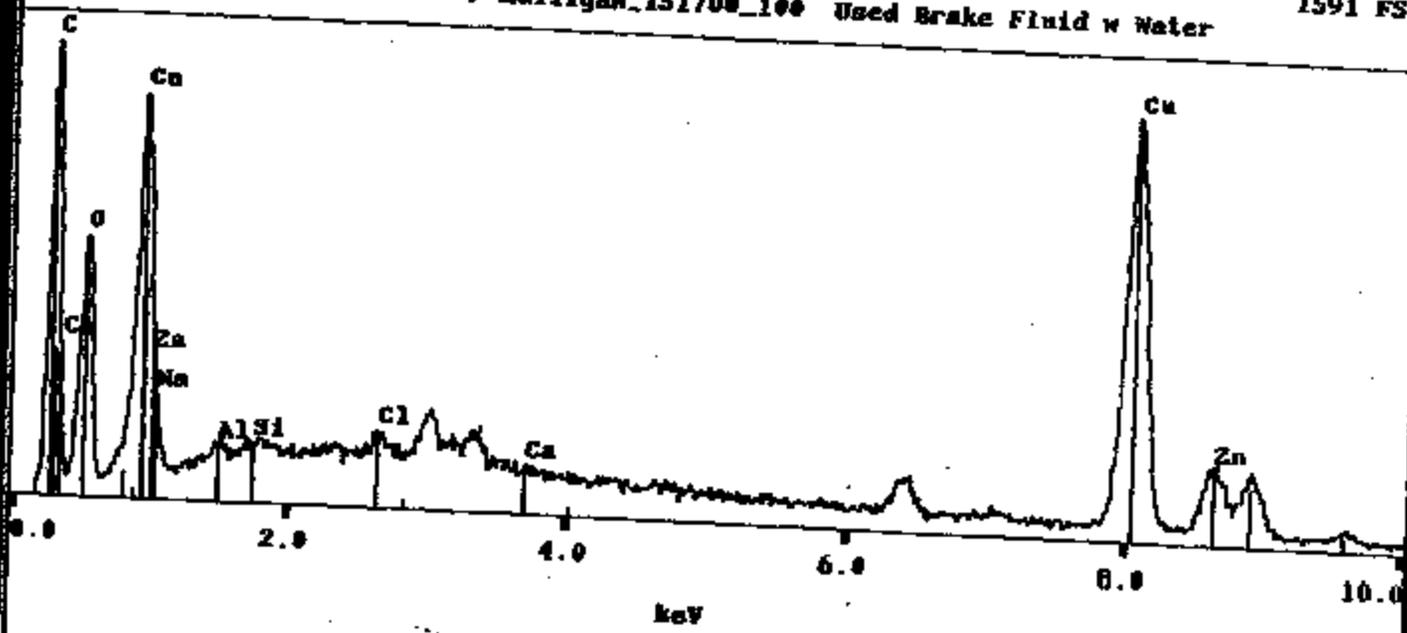


TI-NHTSA 9885

Acquisition completed.

✓ mulligan\_151700\_100 Used Brake Fluid w Water

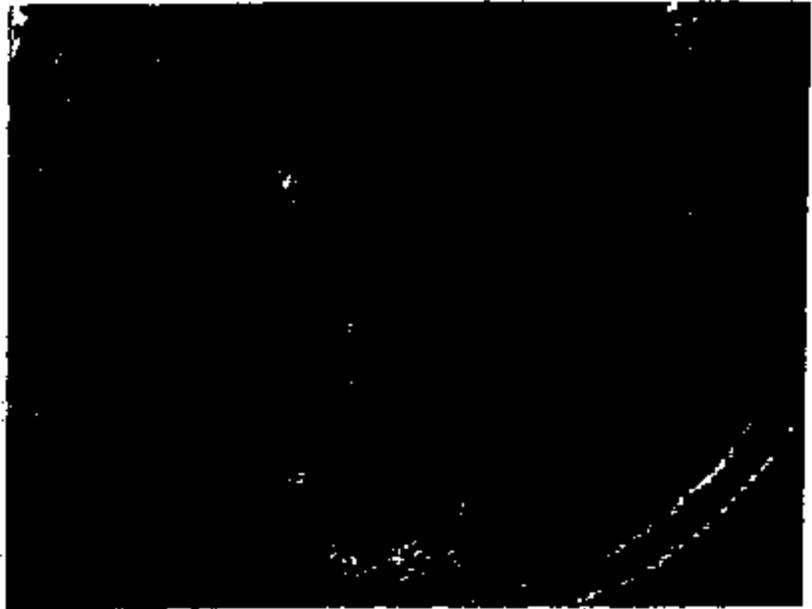
1591 FS



TI-NHTSA 9886



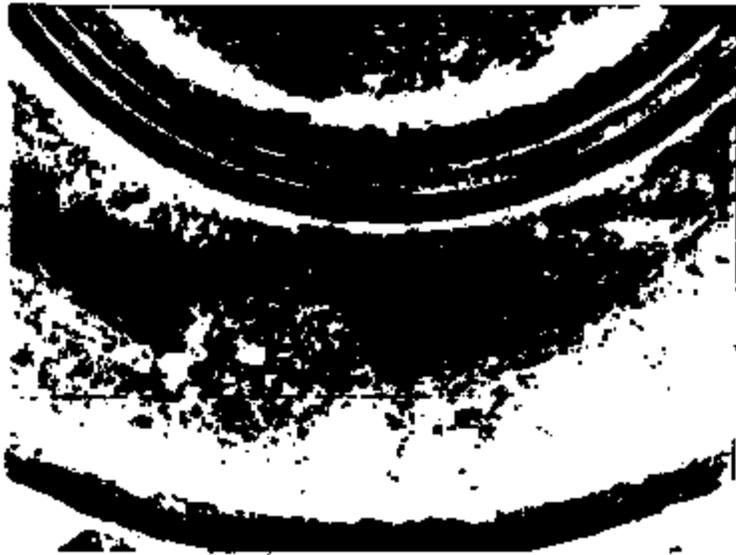
TI-NHTSA 9887



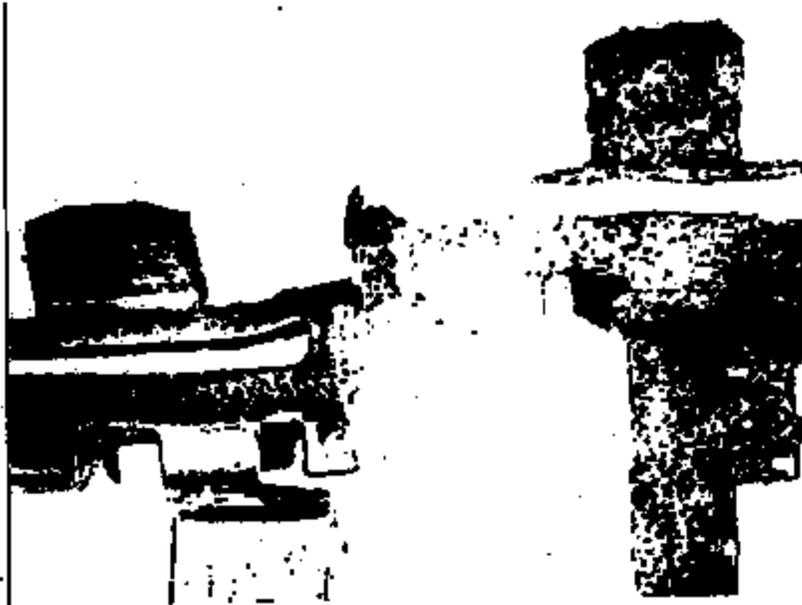
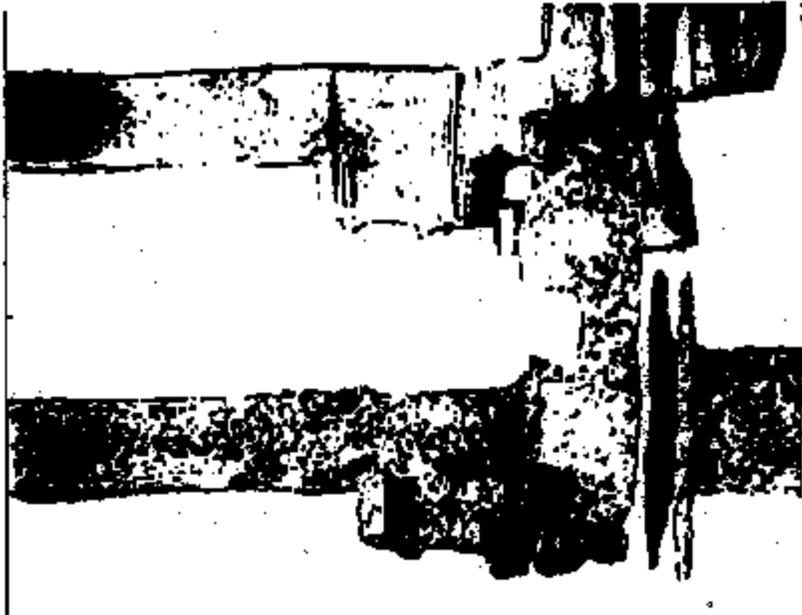
5% NaCl

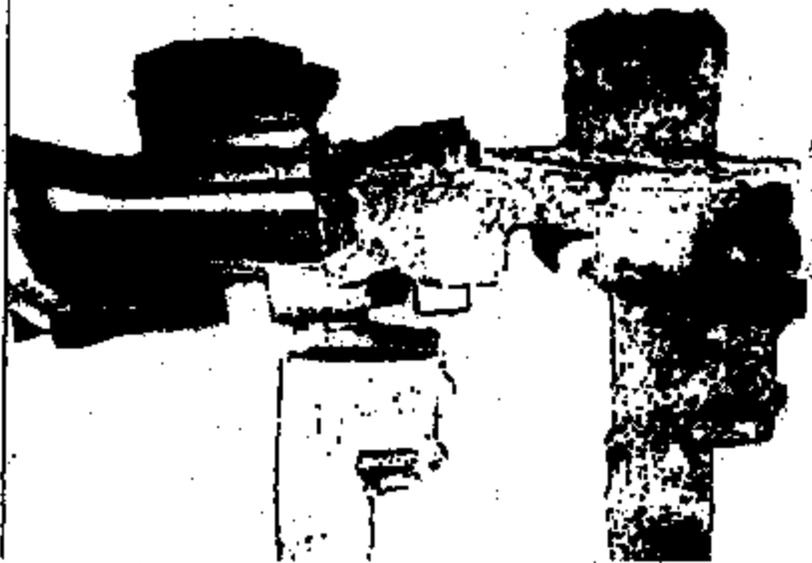


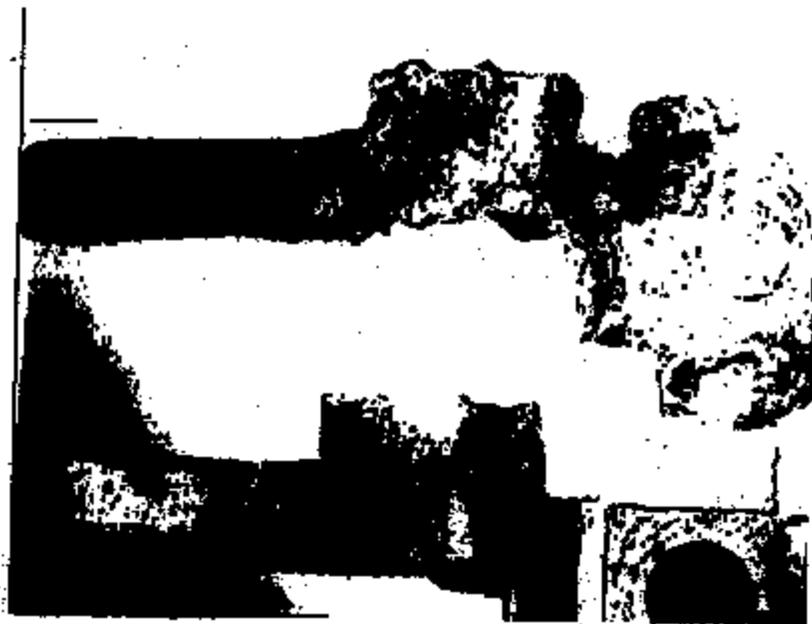
5% NaCl



TI-NHTSA 9889







## TECHNICAL SERVICE LABS

LOG NO. 12472TEST NO. 142010TEST NO. 142010

TRAC ID.	<u>127</u>	STATE YOUR PROBLEM/ SAMPLE DESCRIPTION	INFORMATION DESIRED:		
REQUESTOR COST CENTER	<u>357</u>			Trying to compare these sample among themselves and with samples previously tested	Corrosion composition. Degree of arcing present. Type of corrosion present (electrolytic, oxidation etc.)
PRODUCT CODE	<u>288</u>				
REQUESTOR	<u>S. Mulligan</u>				
MAIL STATION	<u>12-29</u>				
EXTENSION	<u>2535</u>				
MSO ID	<u>SEAM</u>				
DATE SUBMITTED	<u>04/14/99</u>				
DATE REQUIRED					
NO. OF SAMPLES	<u>(3)</u>				
COMPOSITION	<u>NaCl Corrosion in pressure tank</u>				

## REPORT OF RESULTS:

b/m/hr

DATE RECEIVED \_\_\_\_\_ DATE OUT \_\_\_\_\_

TECHNICIAN			
HOURS WORKED			
PROCEDURE USED			

## \*PCC I.D.

MC-325	TM-431	CLKE-122	FACIL-514
PC-127	WIRE-432	CAN-954	FACIL-521
VERS-168	EPD-621	AD DEV-286	FACIL-531
AFCC-483	PEP-622	EMCD-877	STAFF-855
IMD-430	CSD-635		

TI-NHTSA 9893

**FTIR Search**

Spectrum: TSL # 142010, Greenish residue on contact arm

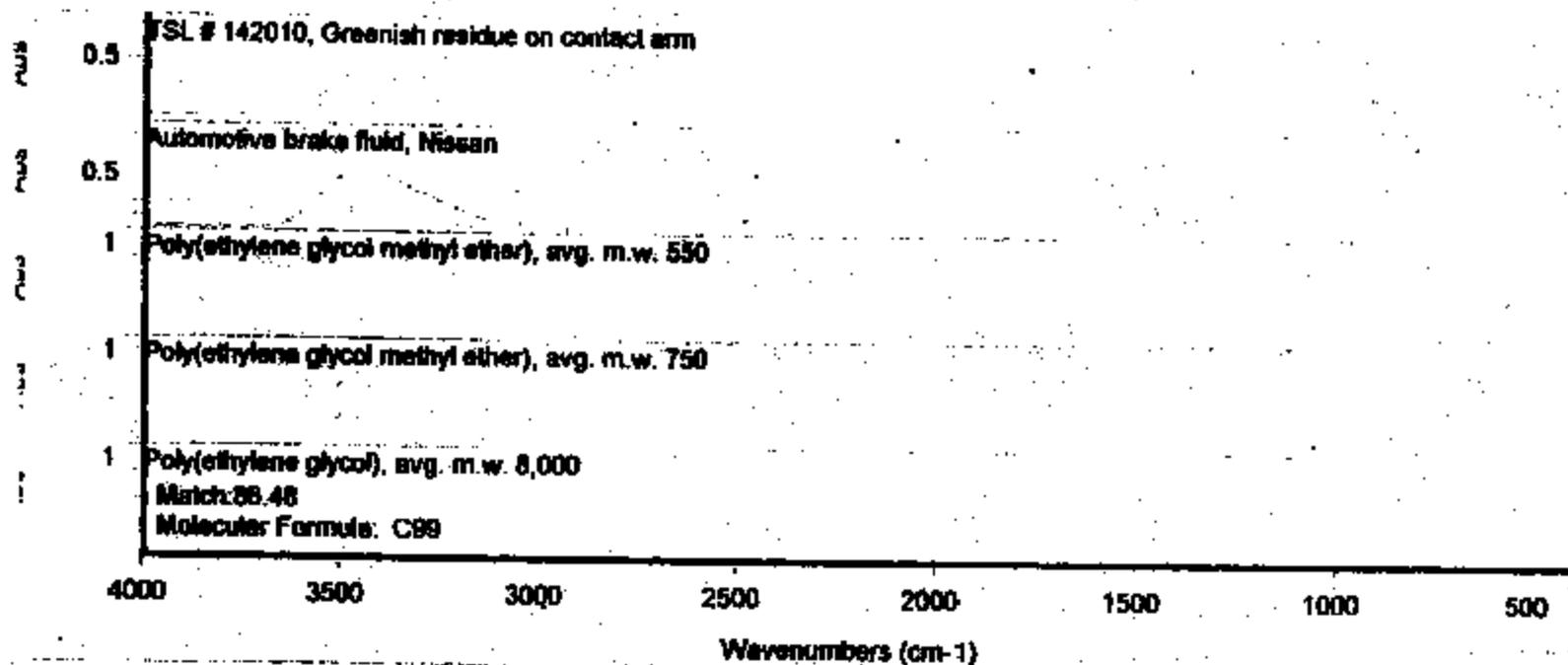
Date: Apr 29 16:39:16 1999

Region: 3995.85 649.98

Search type: Correlation

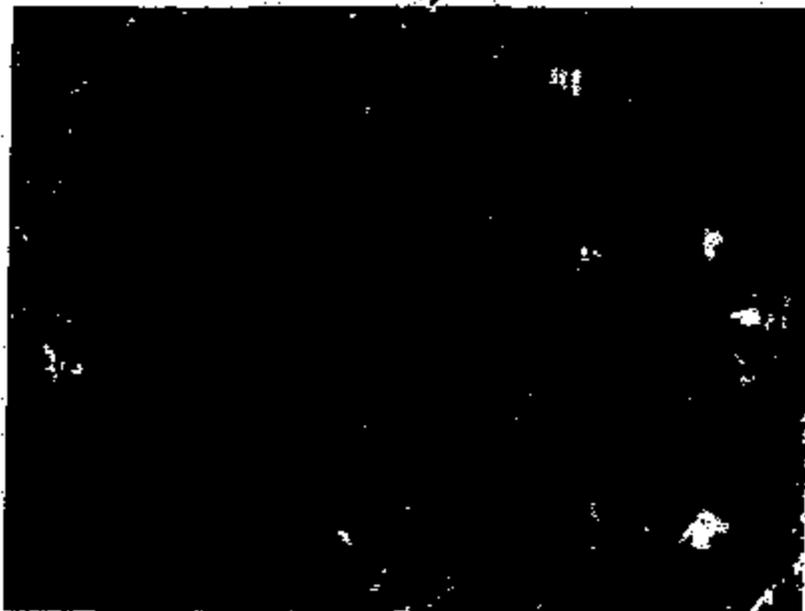
Comments:

246m 450 51



Index	Match	Compound name	Library
981	93.66	Automotive brake fluid, Nissan	TSL
10194	90.12	Poly(ethylene glycol methyl ether), avg.	Aldrich Condensed Phase
10395	87.49	Poly(ethylene glycol methyl ether), avg.	Aldrich Condensed Phase
10392	86.48	Poly(ethylene glycol), avg. m.w. 8,000	Aldrich Condensed Phase
9540	86.40	Fig 99: Polyoxyethylene(20) methyl ether	Aldrich Condensed Phase
9613	86.37	Fig 15: Polyoxyethylene(23) methyl ether	Aldrich Condensed Phase
10388	85.42	Poly(ethylene glycol), avg. m.w. 600	Aldrich Condensed Phase
10393	85.37	Poly(ethylene glycol methyl ether), avg.	Aldrich Condensed Phase
9616	85.36	2-(2-Hydroxyethoxy)ethanol, 99%	Aldrich Condensed Phase
1878	84.70	Tris(2-hydroxyethyl) monomethyl ether	Harwood Polymer and Additives

142010 Impending Burn (18 Hr)



142010 Impending Burn (8 Hr)



TI-NHTSA 9895

4.1RS TAP WATER - COP

142019<sup>01</sup>



Before Cleaning to IPA

4.1RS TAP WATER - COP

Post IPA Cleaning



142010

24 hrs used brake fluid

1-2014 700

816



Before cleaning in IPA

24 hrs used brake fluid - cut

Post IPA cleaning



1-2010

42010 464 VARIABLE



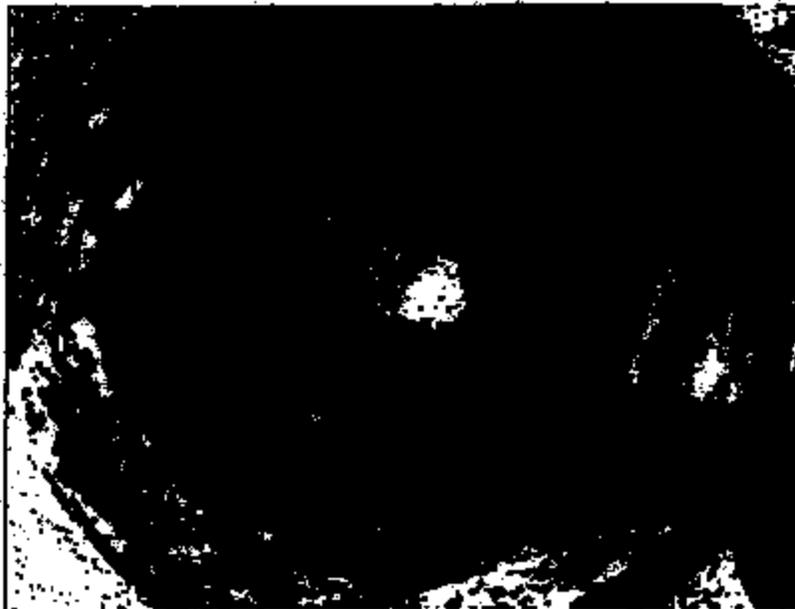
42010 484



42010

48NCS

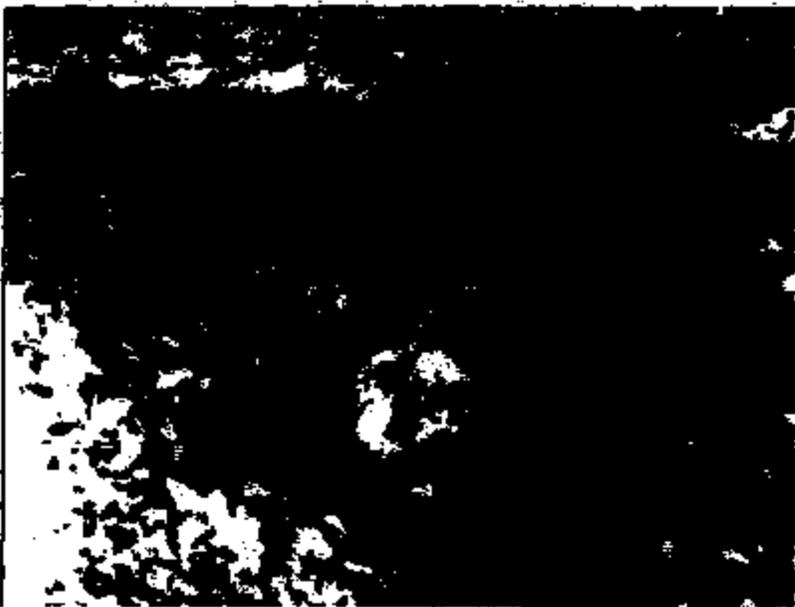
3UP



42010

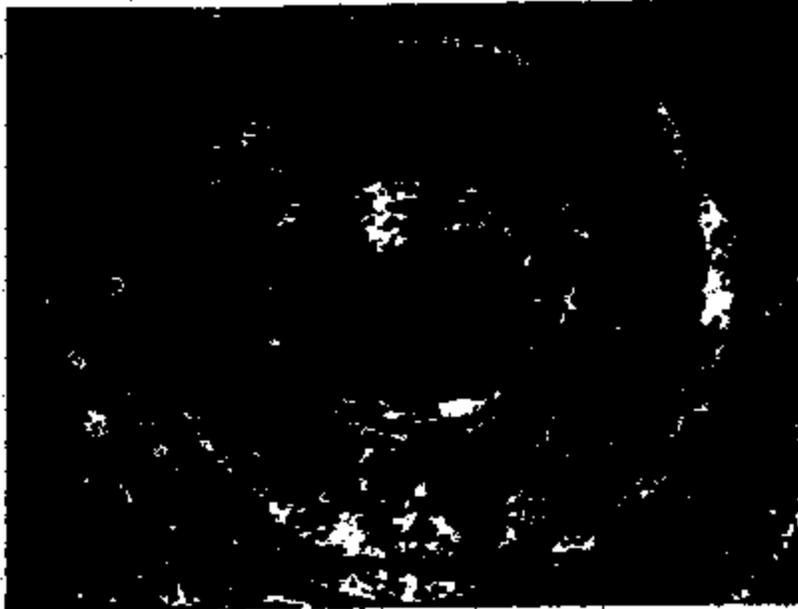
48N

30716NCS



3 HRS IN RAINWATER - CUP

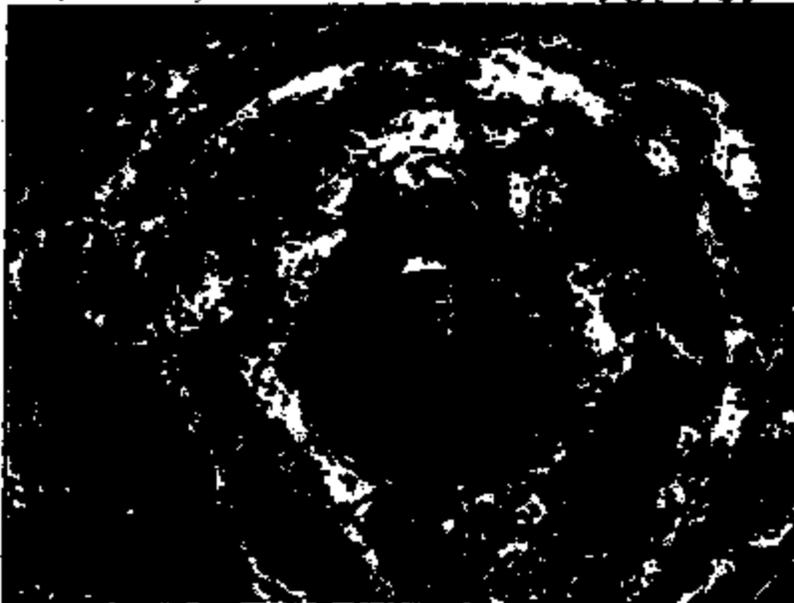
ACT = PA CLEANING



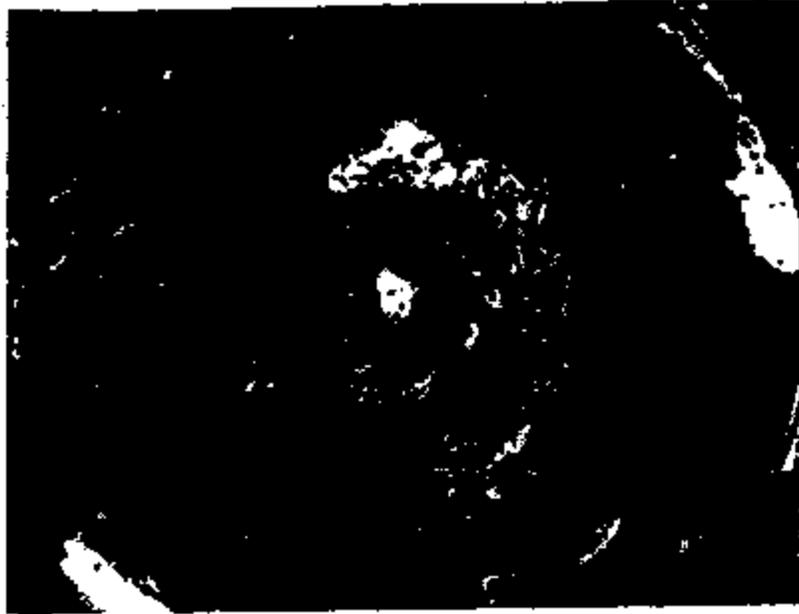
142010

3 HRS RAINWATER - CUP

142610  
151700



before cleaning in IPA



42010 TABLE SALT

142010 TABLE SALT CUP



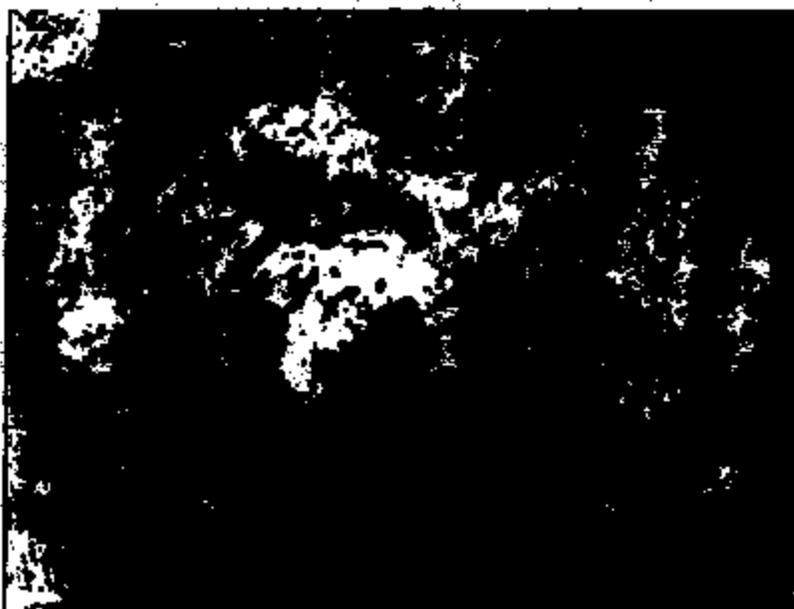
42010 TABLE SALT



42010 TABLE SALT STATIONARY

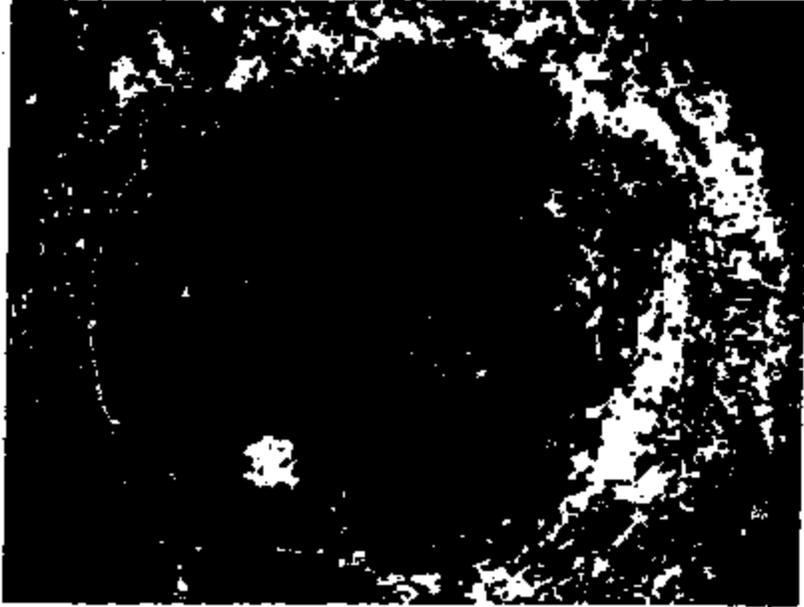


42010 TABLE SALT MOVABLE (RIVER AREA)



42010

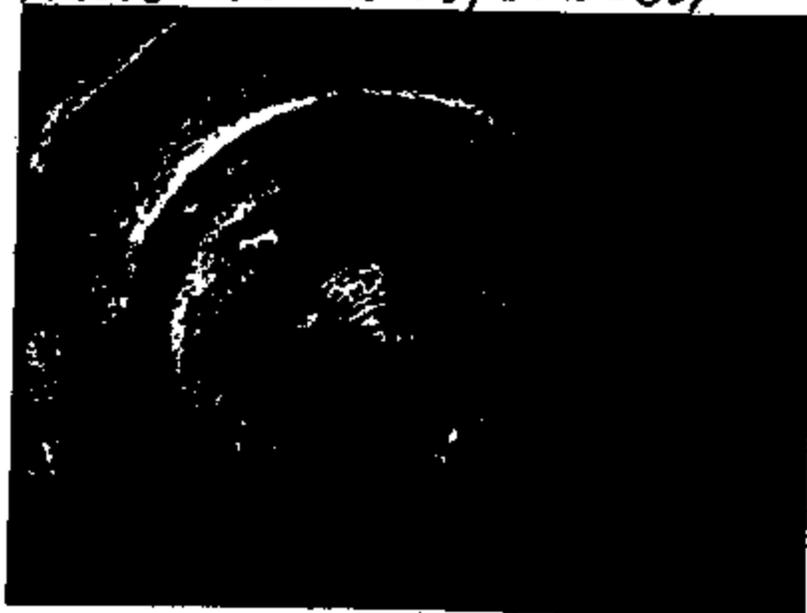
J844



42010 18H Imp. Burn - MOVABLE REMAINS



142010 18H IMPENDING BURN - CUP



TI-NHTSA 9905

42010

18 Hr IMPENDING BURN



42010 18H Imp Burn STATIMARY



TO: SEAN MULLIGAN  
RUSS BAUMAN

ATTORNEY-CLIENT PRIVILEGED COMMUNICATION

99-243: TSL #'S 151700 & 142010: 77PS SIMULATION SAMPLES: ROUGH DRAFT ONLY

OBJECTIVE:

Characterize the samples with regards to contamination, corrosion, and arcing.

SAMPLE EXPOSED TO USED BRAKE FLUID FOR 24 HOURS:

CUP ANALYSIS: The chromate layer is missing in many areas; generally we find relatively uncorroded zinc metal underneath; these areas appear shiny under optical examination. In areas where the chromate isn't missing, we find that substantial amounts of copper have been deposited on top of the chromate surface. A zone showing both types of these areas is shown at various magnifications in Photos 51-64. Elemental distribution maps are also shown in Photos 60 and 65. They show the nodular nature of this copper deposit. This is also documented in Spectra 510-520 which were taken at various voltages (20, 15 and 5 KEV to sort out overlapping layers).

Both the cup and the switch cavity had large amounts of blackish deposit on them. The deposits on the contact arm are being analyzed in the Chem Lab by FT/IR spectroscopy. The deposits on the cup were mainly removed by gentle washing in isopropyl alcohol. Before and after optical photos were taken to document the effect of cleaning. We can't analyze grossly oily samples in the SEM since that would contaminate the equipment.

The data was collected under the guidelines of TSL-S-71, Rev A which can be accessed at <http://www-mcd.nc.ti.com/tsl/>. SEM-EDAX (Scanning Electron Microscope with Energy Dispersive Analysis of X-rays) analysis was used in the above described analysis. The data will be sent through the internal mail.

AL HOPKINS

MSG ID: ANOP

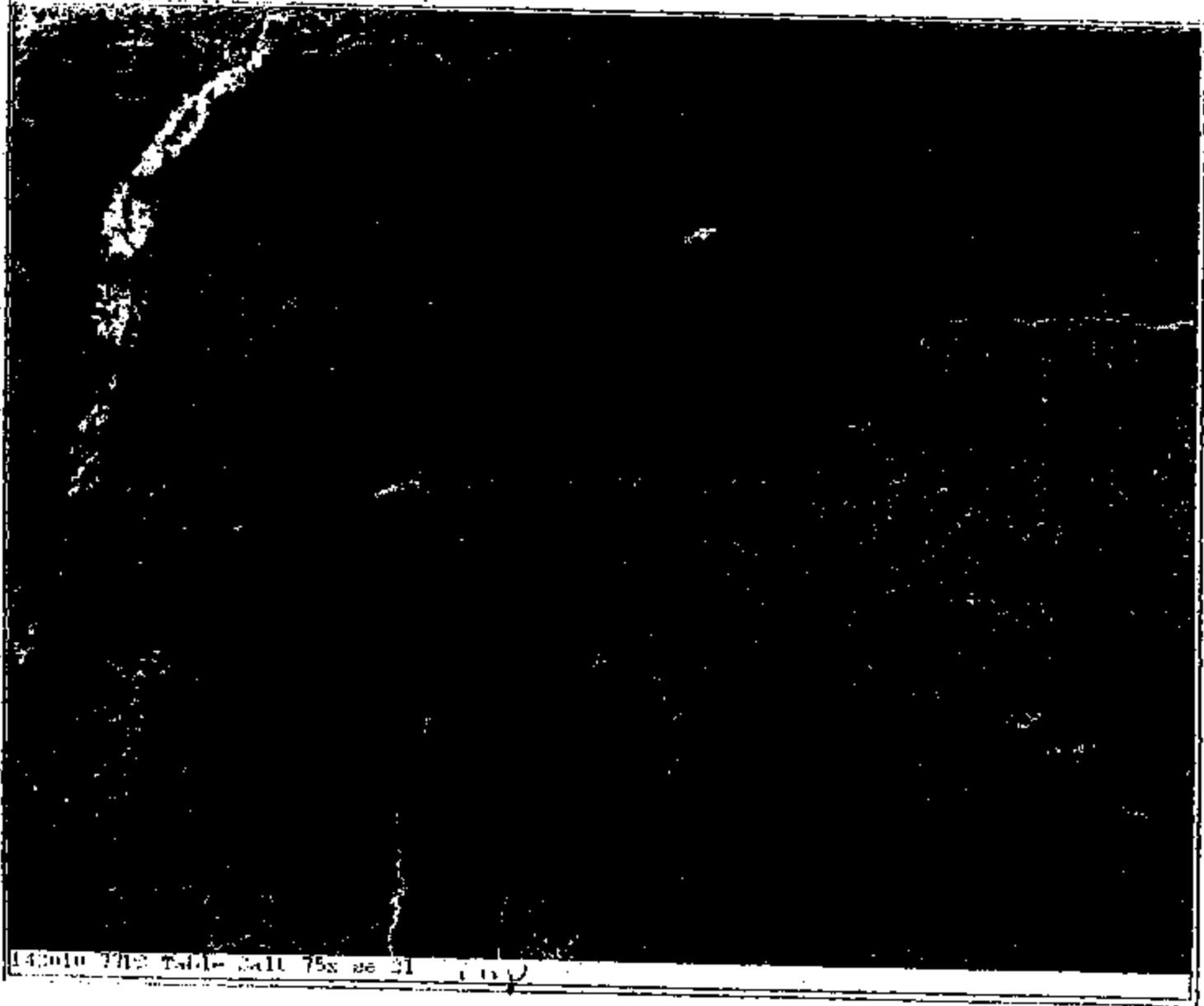
PHONE: 508/236-3040

TI-NHTSA 9907

TI-NHTSA 9908



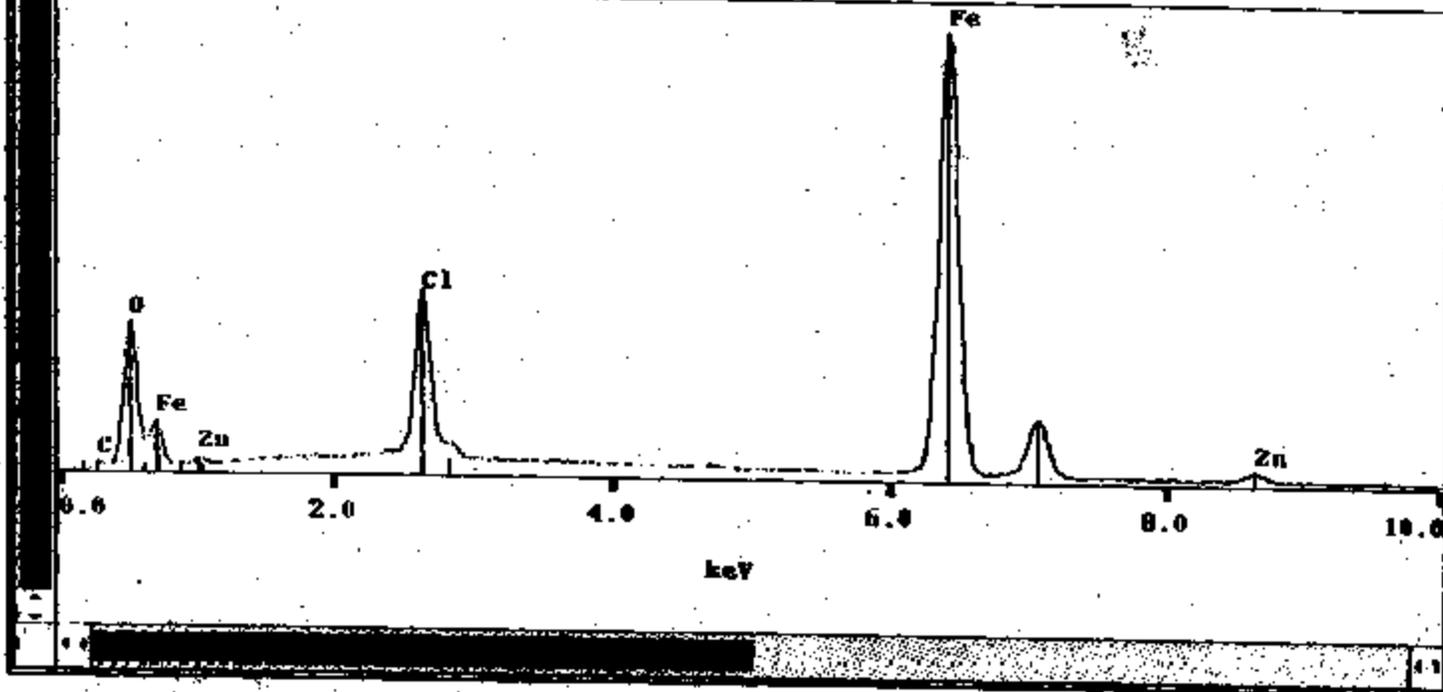
TI-NHTSA 9809



142010 THE T-101- Salt 75x 22 21

Acquisition completed.

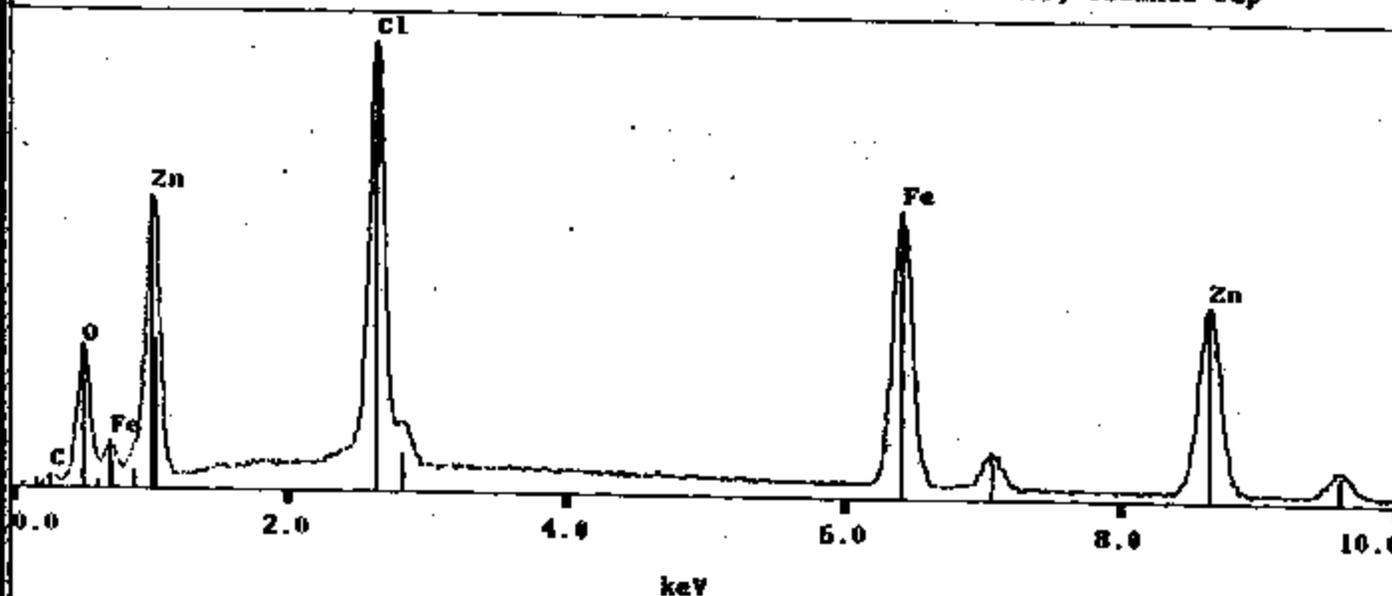
✓ nulligan\_142010\_021 77Ps table salt, cleaned cup 12563 FS

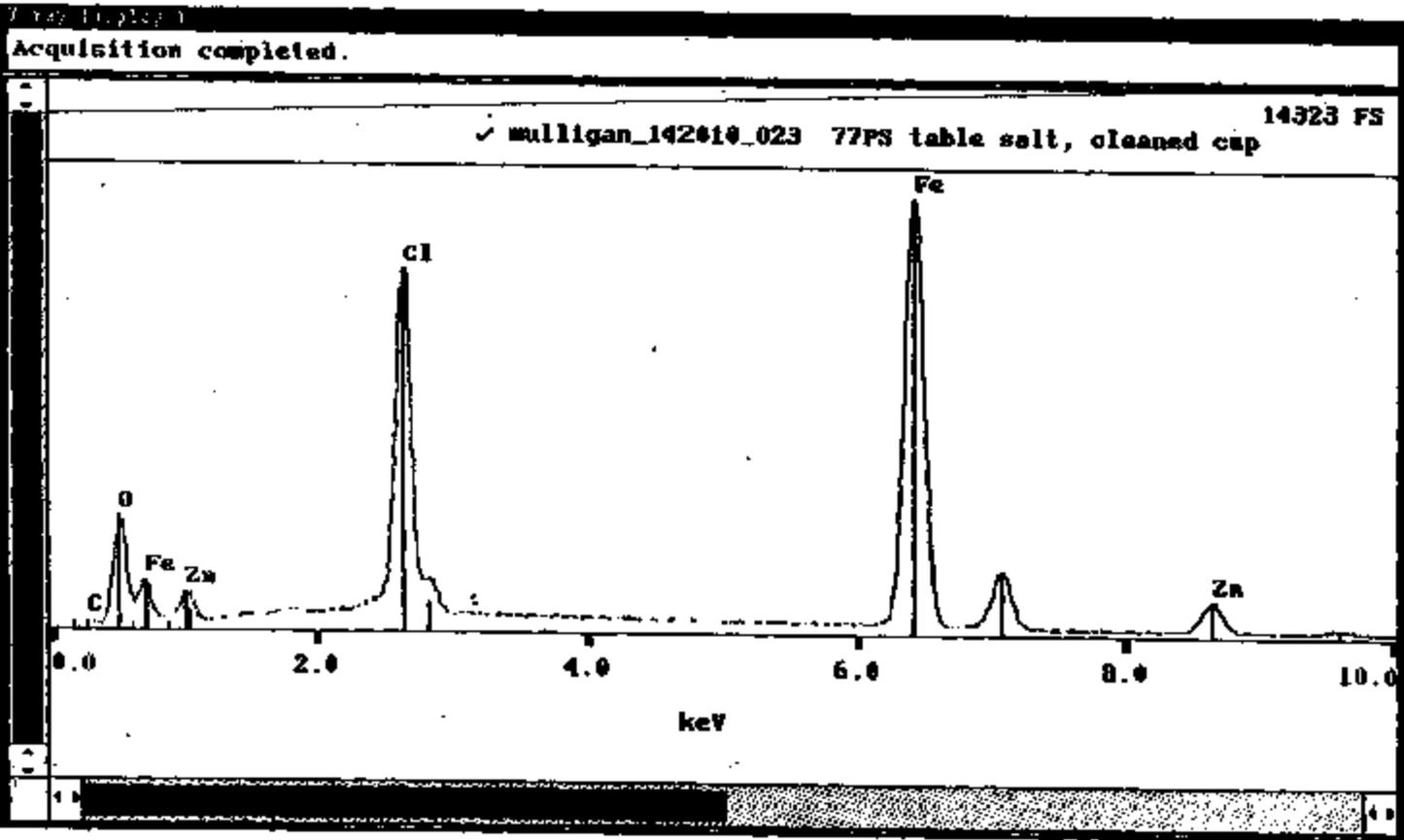


Acquisition completed.

✓ mulligan\_142010\_022 77PS table salt, cleaned cup

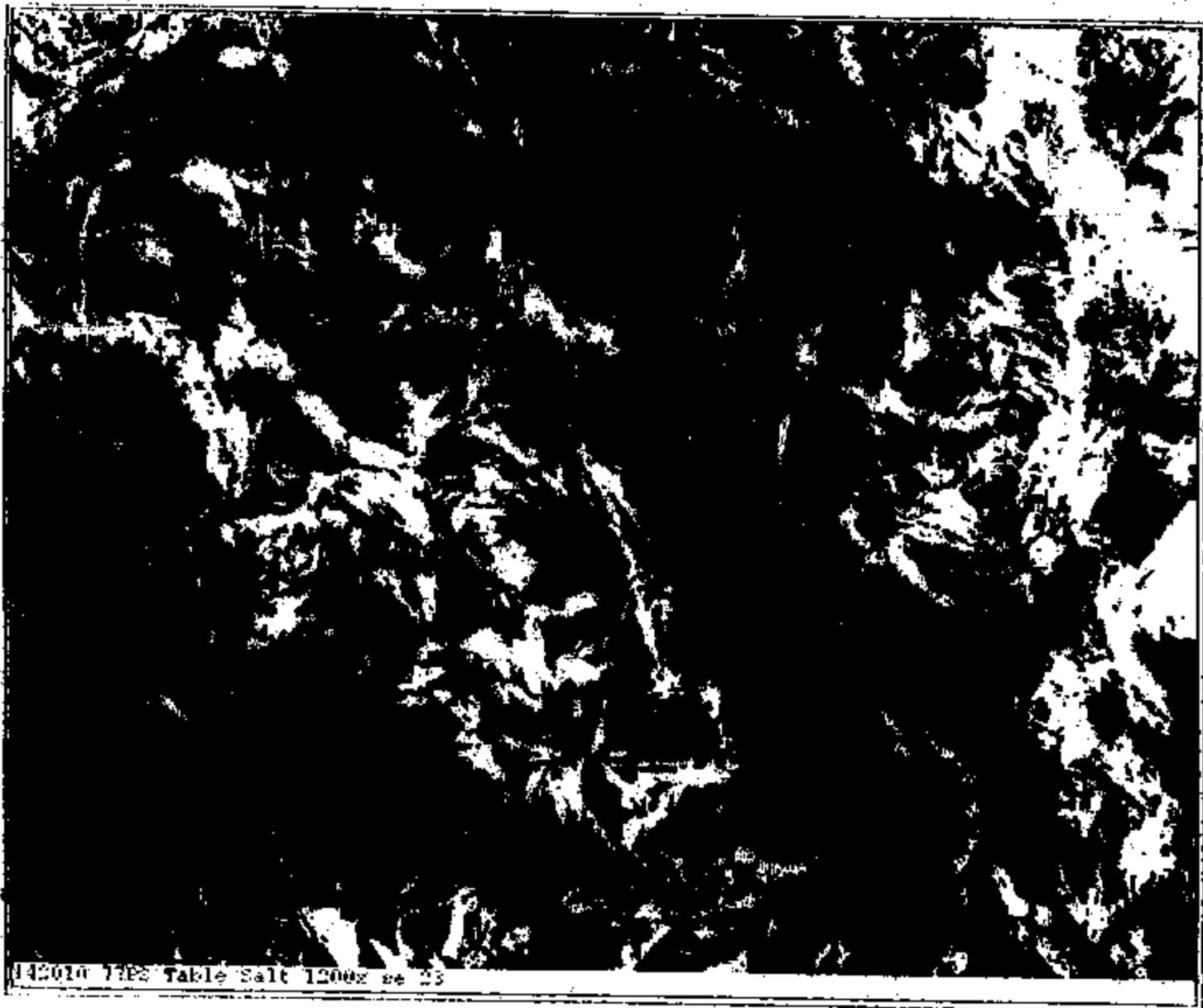
0655 FS



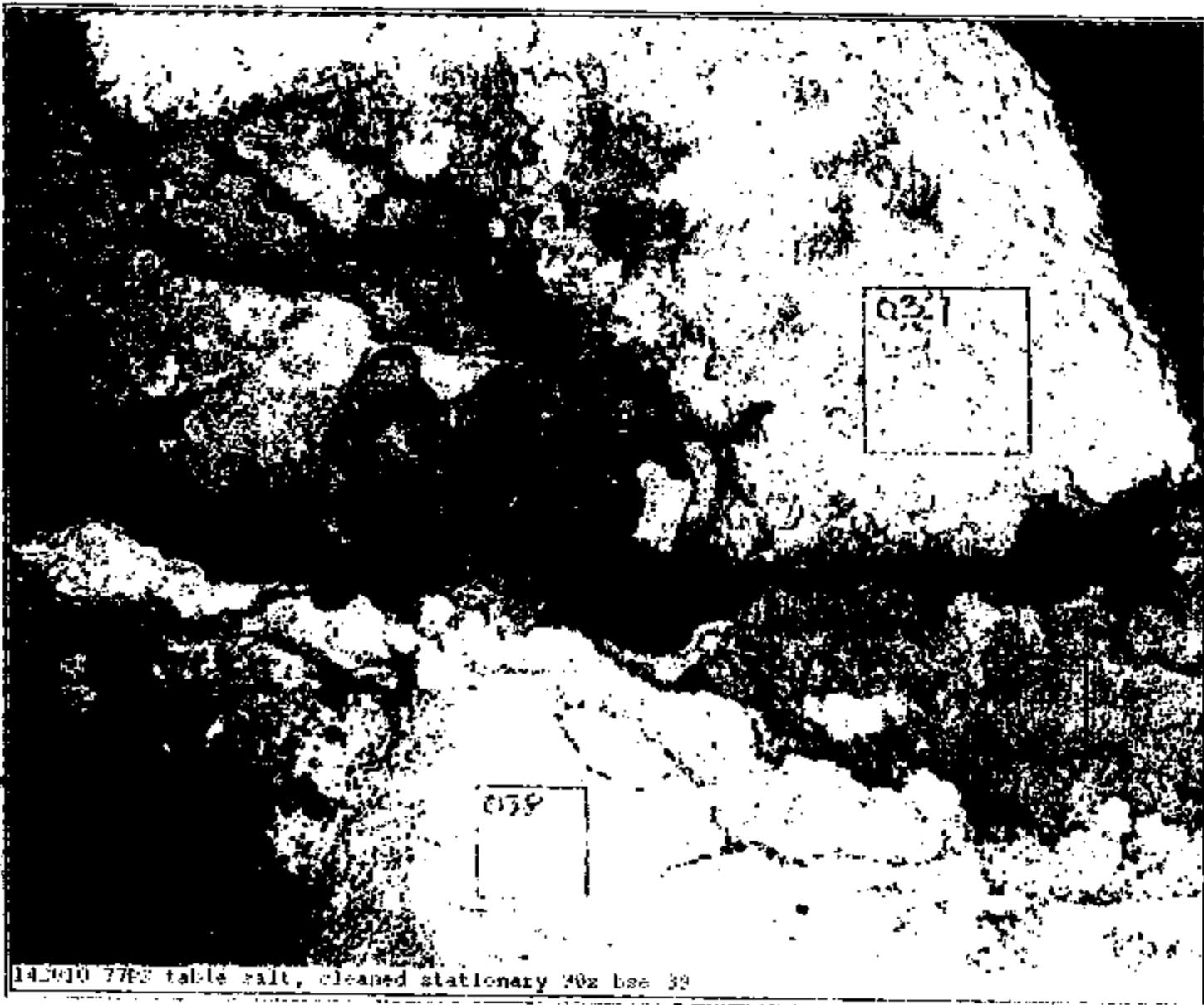


TI-NHTSA 9912

TI-NHTSA 9913



142010 782 Table salt 1200z se 23



037

038

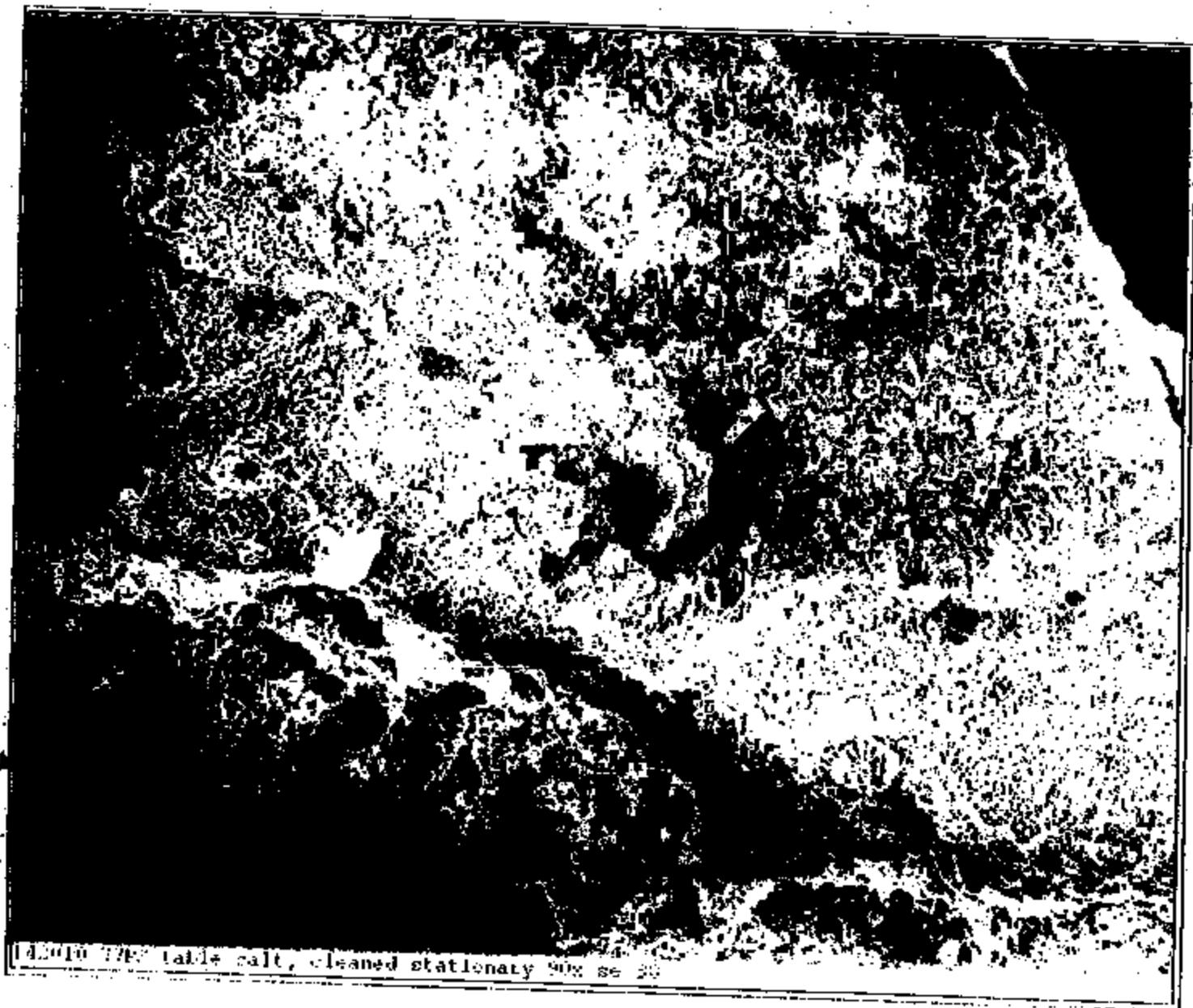
145010 7763 table salt, cleaned stationary 30x lsc 39

TI-NHTSA 8914



142010 7783 table salt, cleaned stationary 22x se 37

T1NH7SA 9918

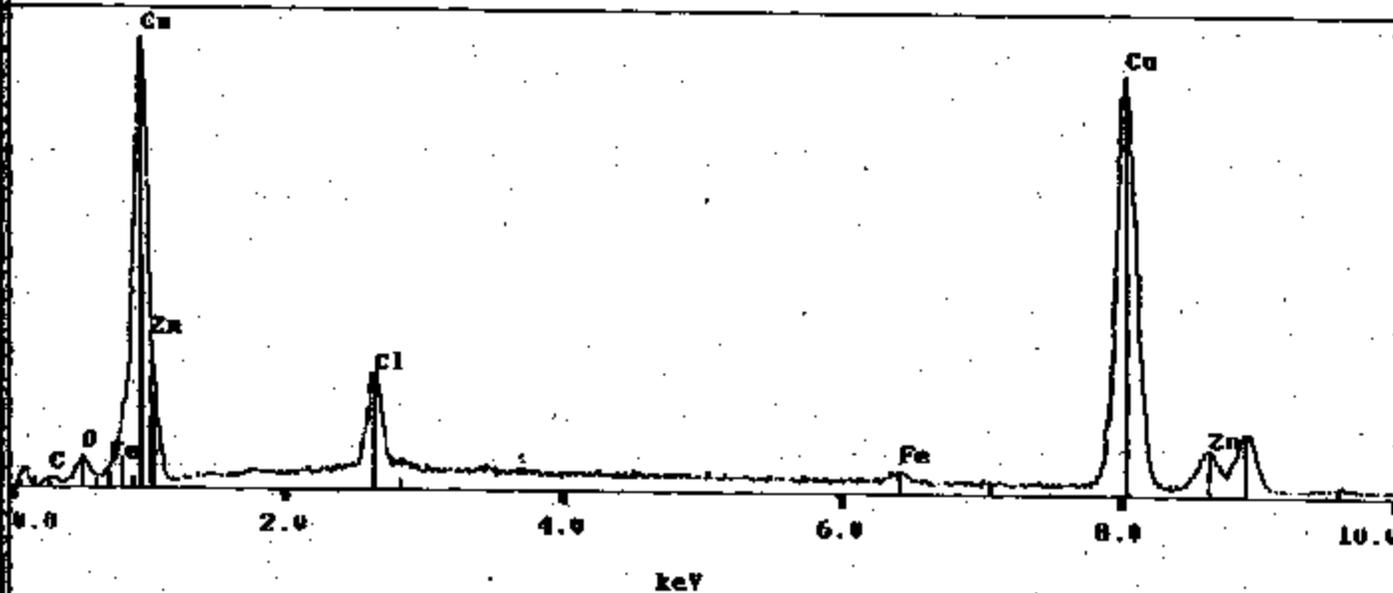


142010 7/73 table salt, cleaned stationary 90x se 20

TI-NHTSA 9918

Acquisition completed.

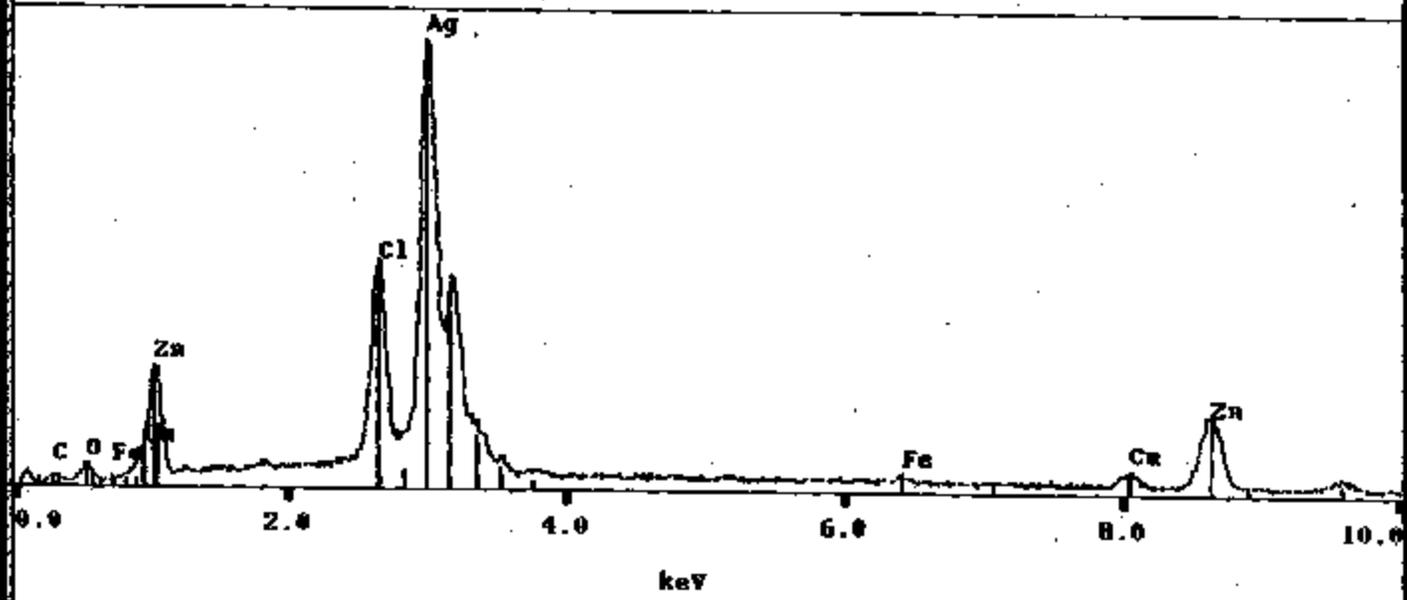
✓ nulligan\_142010\_037 77PS table salt, cleaned stat 3080 FS



TI-NHTSA 9917

Acquisition completed.

✓ walligan\_142010\_038 77PS table salt, cleaned stat 3257 FS



TMNHTSA 9818