付　　属　　資　　料

付属第1資料（1／2）

Mar. 27, '79

REQUIREMENTS TO MOI IN RELATION
TO ASEAN ROCK SALT-SODA ASH PROJECT

J I C A

1. Assignment of the committee acting as the counterpart team for the Japanese Evaluation team

It is requested that this committee is consisted of the representatives of different Government agencies concerned.

2. Nature of the study requested to the Japanese Government

If evaluation is the objective of our study, a concrete or finalized plan on related matters should be shown to the Japanese mission prior to the commencement of their work.

3. Nature of SNC's report

Although the study is very extensive, it can never be thought to be the final feasibility study which is the basis for the request for financing.

Further studies might be needed for the following items:

(1) Rock salt mining method
(2) Estimate of rock salt deposit
(3) Infrastructure and utilities
(4) Marketing of soda ash and fertilizer (A.C.)

Considering the nature of the SNC report, it is requested that the Thai Government will prepare data and information regarding the above.

4. The site for Rack Salt-Soda Ash project

The candidate site for the plant should be shown to the Japanese mission. Otherwise, a study worthy of the name of evaluation can hardly be conducted.

The follow information is to be obtained:

(1) The exact location of the plant site.

(2) Information concerning the proposed commercial deep sea port at Sattahip.

(3) A study of the World Bank on seven industrial projects at Sattahip.

付属第２資料（1／4）

SCOPE OF WORK FOR ASEAN
ROCK SALT - SODA ASH PROJECT (THAILAND)

1. Market Survey

1.1 To review the study report of SNC concerning market of Rock Salt and Soda Ash in ASEAN countries:

1.1.1 Demand/supply balance for rock salt and soda ash (from 1975 to 1990)

1.1.2 C.I.F. price of soda ash and salt from competitive sources

1.1.3 Sales and distribution system for rock salt and soda ash

1.2 To study on situation on Ammonium Chloride regarding

1.2.1 Demand forecast in Thailand

1.2.2 Government policy to promote domestic agricultural production, planted areas, and fertilizer unit comsunption by each crop

1.2.3 Sales and distribution system for Ammonium Chloride

2. Resources and Production of Bamnet Narong Rock Salt

To review and analyze available information and data including the study of SNC concerning;

2.1 Location of mining site and accessibility

2.2 Physical features and geological condition of the mining site

2.3 Reserves and deposits as well as rock salt quality

2.4 Mining method including mining and processing equipment and facilities

2.5 Capital investment and production cost

3. Resources and Production of Khao Pang Sok Limestone

To review and evaluate available information and data concerning

3.1 Location of limestone quarry and accessibility

3.2 Physical features and geological condition of limestone quarry

3.3 Reserves and deposits as well as limestone quality

3.4 Quarrying method including quarrying and processing equipment and facilities

3.5 Capital investment and production cost

4. Soda Ash Manufacturing Plant

To review and evaluate the SNC report regarding;

4.1 Manufacturing processes

4.1.1 Solvay process

4.1.2 Ammonium Chloride co-production process

4.1.3 Ammonium Chloride partial co-production process

4.2 Manufacturing plant

4.2.1 Plant capacity

4.2.2 Process flow chart

4.2.3 Plant lay-out

4.2.4 Major equipment list

4.2.5 Requirement of raw materials and utilities including unit consumption

4.2.6 Manning requirements

4.2.7 Pollution aspects

4.3 Construction schedule and start up plan

4.4 Capital investment and production cost

4.5 Ammonia

4.5.1 Domestic availability

4.5.2 Import possibility

5. Infrastructure and Related Facilities

To review and evaluate the available information and data regarding;

5.1 Railway

5.2 Road

5.3 Deep Sea Port

5.4 Housing and accommodations

6. Transportation of Raw Materials and Products

To review and evaluate the available information and data concerning;

6.1 Rock salt

6.2 Limestone

6.3 Soda ash

7. Utilities

To review and evaluate the available information and data regarding;

7.1 Industrial water

7.2 Electric power

7.3 Natural gas

8. Plant Site Investigation

To investigate the proposed Soda Ash manufacturing plant site in Sattahip

8.1 Meteorological and geological conditions

8.2 Disposal of industrial effluents

8.3 Site development

9. Project Cost Estimate Showing Foreign and Local Currency

10. Financial Assumption for the Evaluation

10.1 Bases for the evaluation

10.2 Internal rate of return on investment

10.3 Sensitivity analysis

SUPPLEMENTARY NOTE TO THE SCOPE OF WORK FOR ASEAN ROCK SALT-SODA ASH (THAILAND)

During the discussions on the scope of work for the ASEAN rock salt-soda ash project (Thailand) on 28th March, 1979, the following remarks were made by the Thai and Japanese sides.

1. The Japanese team made the observation that the study done by SNC on rock salt reserves is not sufficient to prove the economic and commerical viability of rock salt reserves.

Additional drilling works, chemical analysis of the samples of rock salt as well as the study of rock mechanics are necessary and essential before undertaking the evaluation study.

2. The Thai side agreed to the Japanese observation and proposed that additional drillings of 3,000 feet at the proposed mine site, will be undertaken by the Thai side provided that the Japanese side will conduct chemical analysis of rock salt and study of rock mechanis in Japan.

3. The Japanese side agreeds to study the Thai proposal on its return to Japan.

4. Both sides shall attempt to take whatever steps required to solve the questions raised in paragraphs 1 and 2 above with the spirit of cooperation.

附属第4資料（1／2）

入手資料リスト

1-1 Summary of Incentive
Under Investment Promotion Act B.E. 2520 (1977)

1-2 List of Activities Eligible for Promotion
and
Activities Suspended by the Board of Investment

1-3 Announcement of the Board of Investment
No. 36/2521
Subject: Designation of Investment Promotion Zones

1-4 Allowable Trade Effluent Standard Ministry of Industry

1-5 Basic Agreement on ASEAN Industrial Project

1-6 Agreement on ASEAN Preferential Trading Arrangements

1-7 Possible New Urban Areas with Reuse of Military Land

1-8 Improvement and Conservation of National Environmental Quality Ace (No. 2)

1-9 Permanent Way Maintenance (State Railway of Thailand)

1-10 1978 Information Booklet (" " ")

1-11 Thailand Business-Legal Handbook

1-12 Minerals Act (No. 2)

1-13 肥料の生産・輸入実績表

1-14 Sattahip 近隣地図

1-15 Residual Cl^- and $SO_4^=$ - S in Cropped Soils Following Addition of NH_4 Cl and $(NH_4)_2$ SO_4 Fertilizer

1-16 タイ国電送計画図

2- 1 Summary Core Logs of Drill Holes for Feasibility Study on Rock Salt and Soda Ash Project. (Bamnet Narong area)

2- 2 Potash Deposits of Northeast Thailand

2- 3 The Evaporite Deposits of Northeast Thailand

2- 4 Ground Water Resources Development of Notteastern Thailand

2- 5 Topographic Map of the Bamnet Narong area, on a scale of 1:50,000 (Copy)

2- 6 Topographic Map of the Khao Pang Sok area, on a scale of 1:50,000 (Copy)

2- 7 Sample of Rock Salt Core (= 1 Kg)

2- 8 Sample of Limestone (= 1 Kg)

2- 9 Maps on the SNC Feasibility Study Report

(1) Map 6, Isopach Map Thickness of Overburden/Rock

(2) Geological Section (A-A', B-B', C-C', and D-D')

(3) Topographic Map of Bamnet Narong Rock Salt Deposit

2-10 Test Report for Soil by K.E.C. of Bangkok

2-11 Railway Map, 1:1,000,000 (Copy)

2-12 Location Map of Sattahip Port Site, 1:50,000 (Copy)

附属第５資料

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

P.O. BOX 216 MITSUI BLDG.

2-1, NISHI-SHINJUKU, SHINJUKU-KU, TOKYO

160 JAPAN

CHEMICAL AND X-RAY ANALYSIS DATA

Bamnet Narong (Rock Salt)

Kao Pang Sok (Limestone)

April 1979

J I C A

CHEMICAL ANALYSIS DATA

A. ROCK SALT (Bamnet Narong Site)

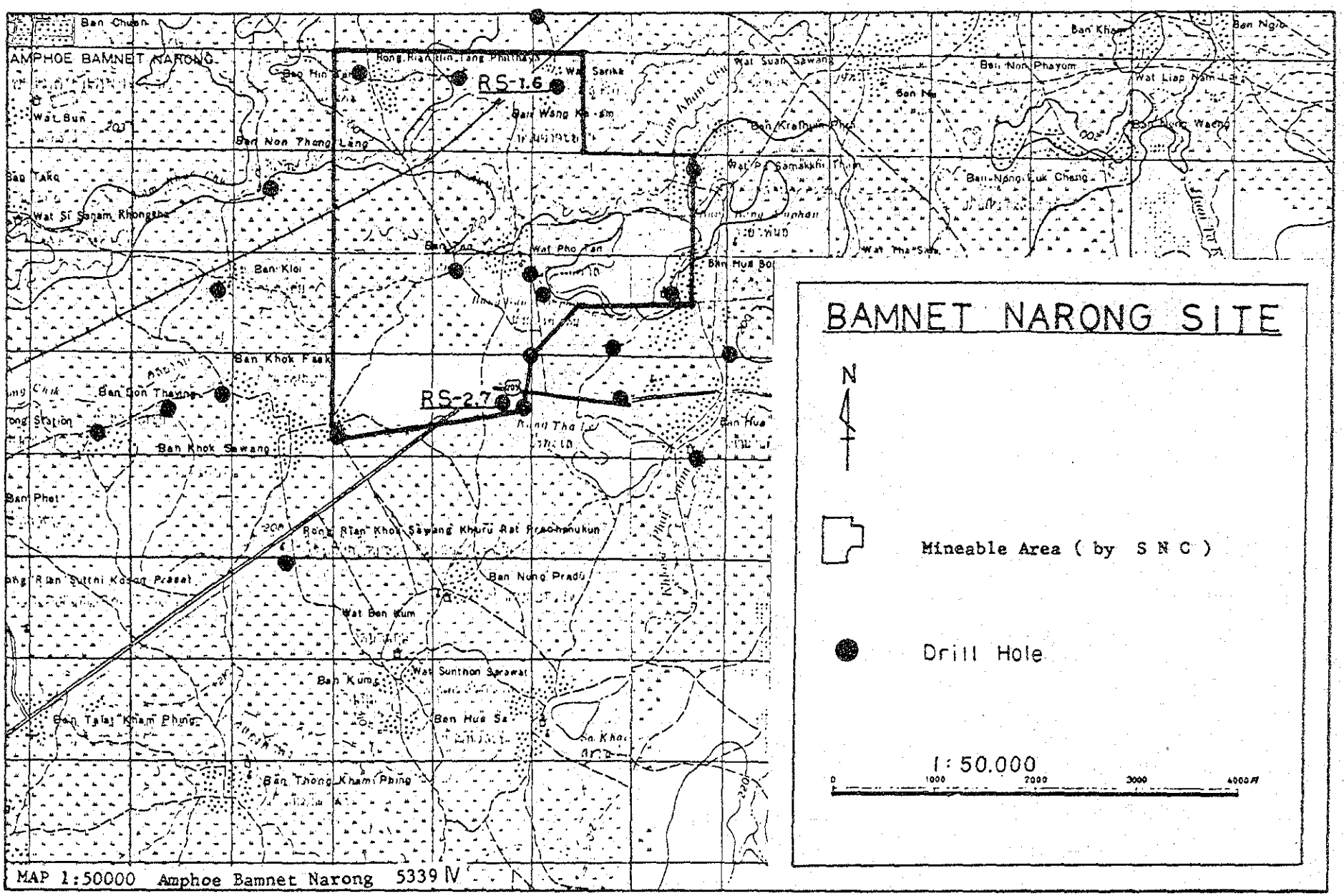
(by % wt)

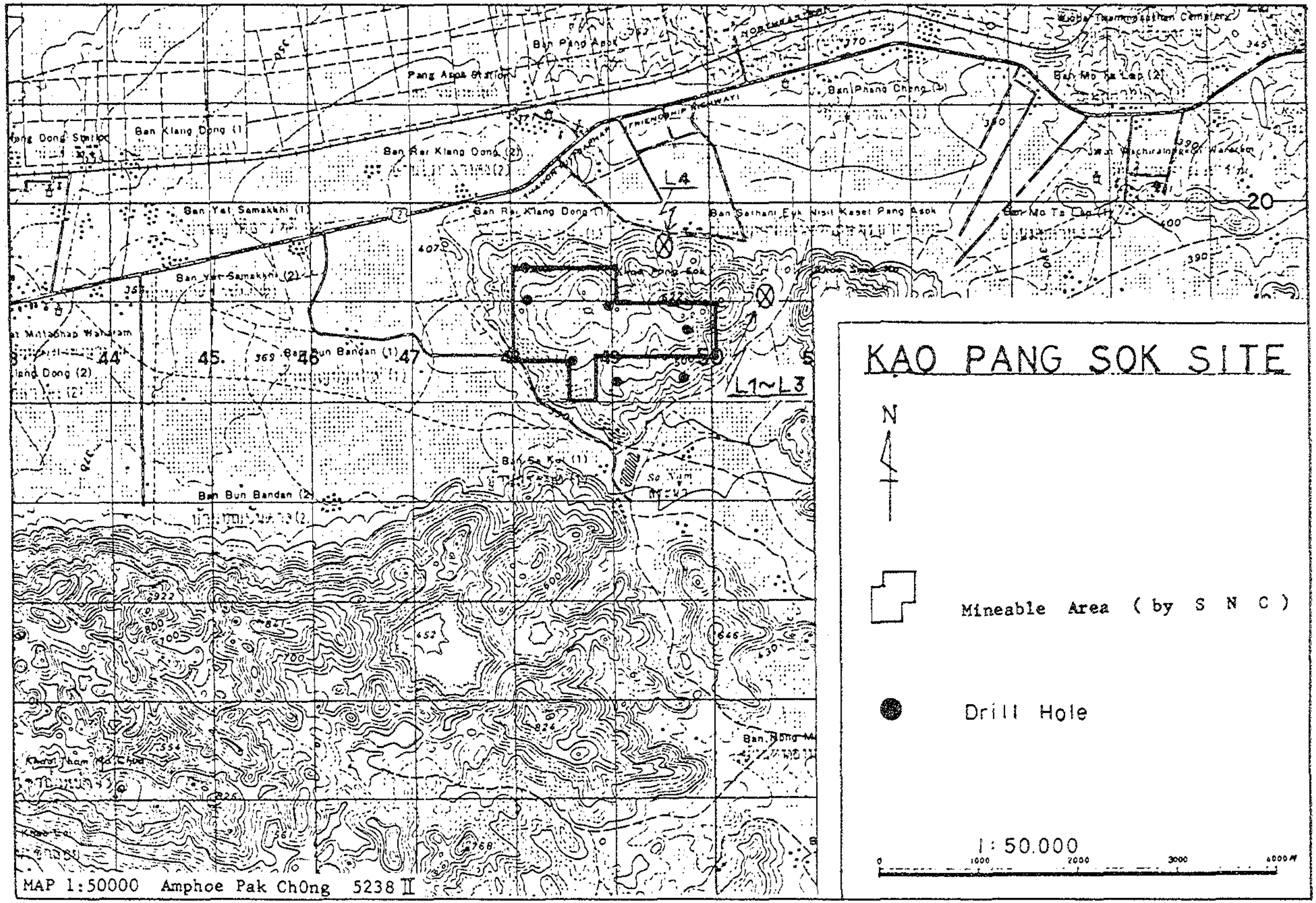
Sample	Locality	H_2O	I.M	Cl	H	H	Mg	K	Na	Total	NaCl
S-1	Drilling #RS-1.6 350'3" - 350'9"	0.1	0.86	59.60	0.57	0.21	0.02	0.02	38.65	100.03	98.25
S-2	Drilling #RS-2.7 349' - 350'20"	0.1	0.27	60.28	0.15	0.06	0.00	0.01	39.10	99.97	99.39

B. LIMESTONE (Kao Pang Sok Site)

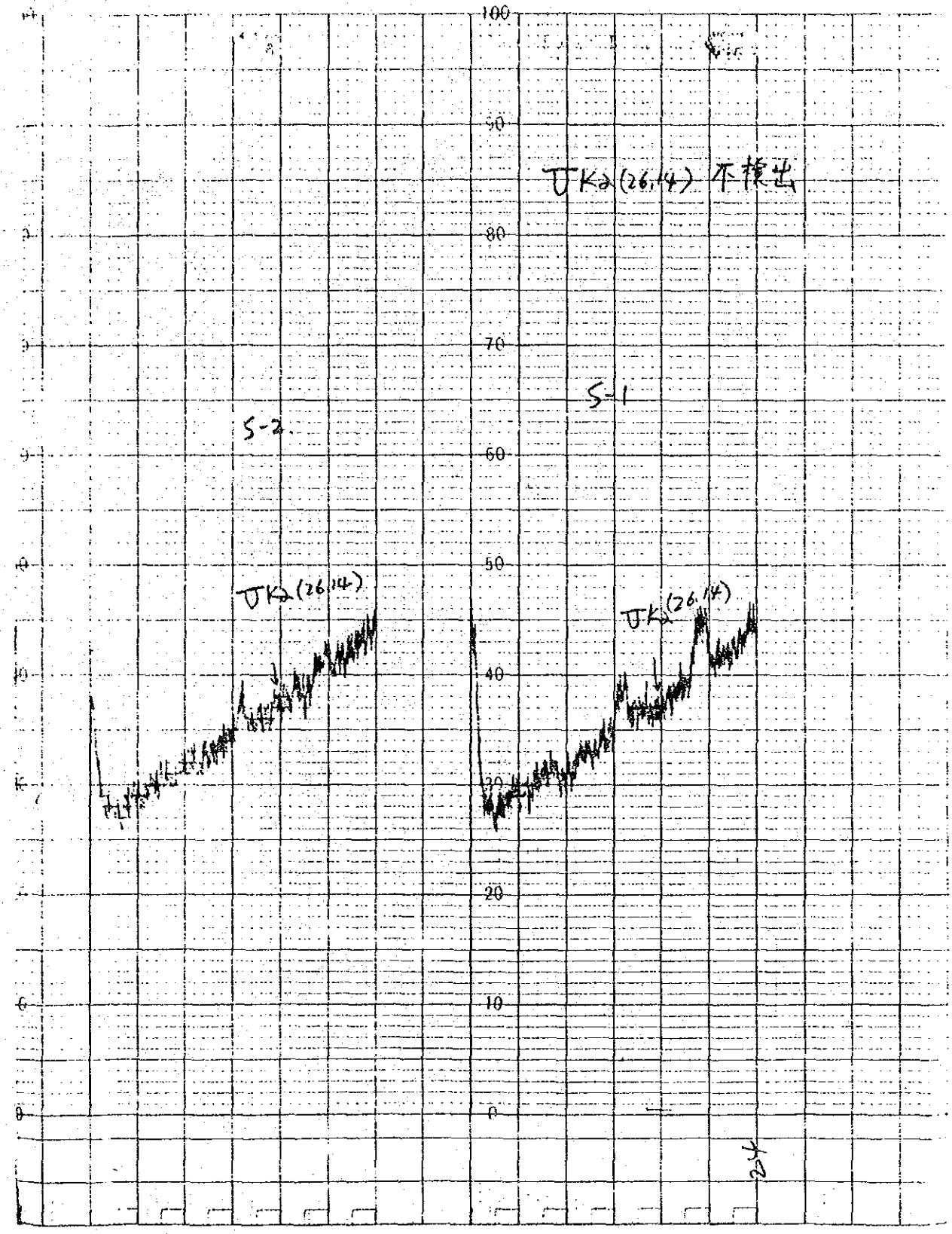
(by % wt)

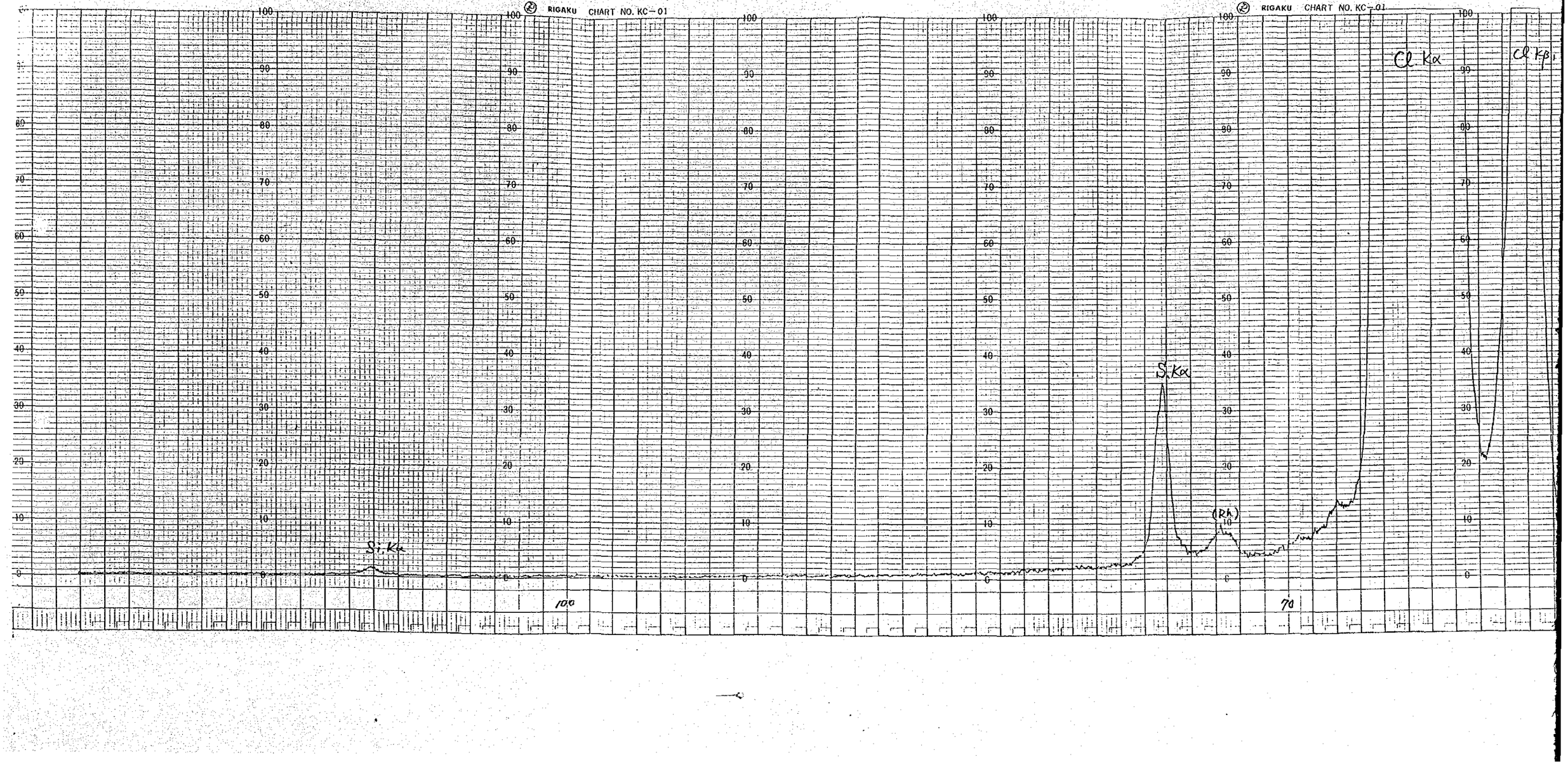
Sample	Locality	$CaCO_3$	MgO	SiO_2	Fe_2O_3	Al_2O_3	
L-1	East side of mining site	99.1	0.2	0.02	0.02	0.02	
L-2	"	98.8	0.3	0.20	0.08	0.07	
L-3	"	98.8	0.4	0.06	0.02	0.05	
L-4	North side of mining site	61.0	18.2	0.30	0.05	0.07	


AMPHOE BAMNET NARONG
RS-1.6
RS-2.7
Ban Non Thong Lang
Ban Khok Faek
Ban Khok Sawang
Ban Don Thaeng
Ban Klai
Ban Phet
Ban Nong Pradu
Wat Ban Kum
Ban Kum
Ban Thong Kham Phung
Ban Talat Kham Phung
Wat Suan Sawang
Ban Non Phayum
Wat Liap Nam
Ban Nang Luk Chang
Wat Pho Tan
Ban Hua Bo
BAMNET NARONG SITE
N
Mineable Area (by S N C)
Drill Hole
1 : 50.000
0
1000
2000
3000
4000 M
MAP 1:50000 Amphoe Bamnet Narong 5339 IV

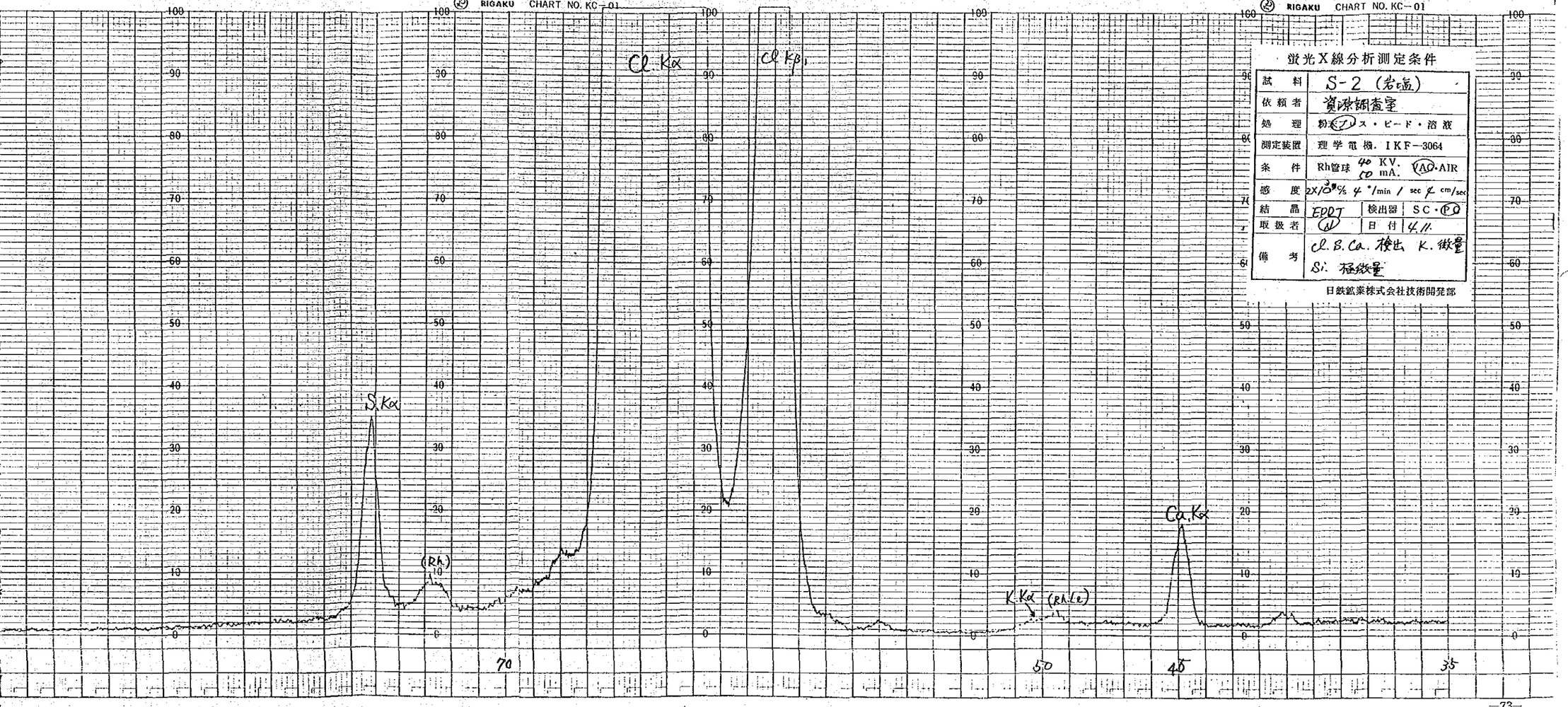

KAO PANG SOK SITE
N
Mineable Area (by S N C)
Drill Hole
1 : 50.000
0
1000
2000
3000
4000 M
MAP 1:50000 Amphoe Pak ChOng 5238 II
L4
L1~L3
44
45.
46
47
49
50
20
Ban Pang Asok
Pang Asok Station
Ban Klang Dong (1)
Ban Rai Klang Dong (2)
Ban Yat Samakkhi (1)
Ban Yat Samakkhi (2)
Ban Rai Klang Dong (1)
Ban Sathani Eyk Nisit Kaset Pang Asok
Ban Phang Cheng (1)
Ban Mo Ta Lap (2)
Ban Mo Ta Lap (1)
Ban Bun Bandan (1)
Ban Bun Bandan (2)
So Yum
FRIENDSHIP HIGHWAY
Dong (2)
Wat Mittaphap Wanaram
370
345
390
400
407
369
652
646
630
922
800
700
824
554
626
768

X 線 チ ャ ー ト


100
90
80
70
60
50
40
30
20
10
0
UK2(26.14) 不検出
S-1
S-2
UK2(26.14)
UK2(26.14)


RIGAKU CHART NO. KC-01
RIGAKU CHART NO. KC-01
Cl Kα
Cl Kβ
S Kα
(Rh)
Si Kα
100
90
80
70
60
50
40
30
20
10
0

RIGAKU CHART NO. KC-01



RIGAKU CHART NO. KC-01

蛍光X線分析測定条件

試料	S-2 (岩塩)		
依頼者	資源調査室		
処理	粉末・プレス・ビード・溶液		
測定装置	理学電機. IKF-3064		
条件	Rh管球 40 KV. 50 mA. VAC・AIR		
感度	2×10³ cps 4 °/min / sec 4 cm/sec		
結晶	EDDT	検出器	SC・PC
取扱者	W	日付	4.11.
備考	Cl. B. Ca. 検出 K. 微量 Si. 極微量		

日鉄鉱業株式会社技術開発部

RIGAKU CHART NO. KC-01

RIGAKU CHART NO. KC-01

Fe.Kα

Ni.Kα

Cu.Kα

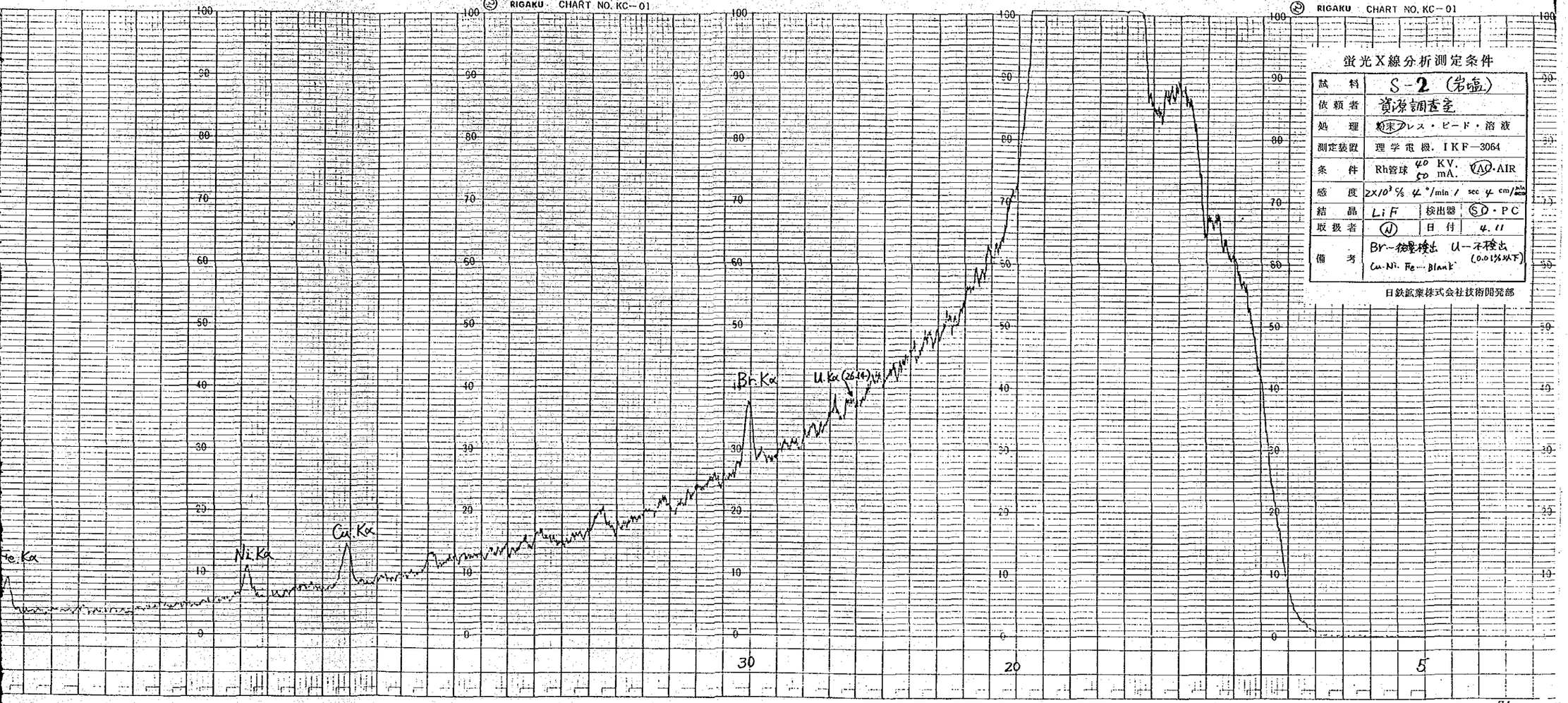
Br.Kα

80

60

30

RIGAKU CHART NO. KC-01



RIGAKU CHART NO. KC-01

蛍光X線分析測定条件

試料	S-2 (岩塩)		
依頼者	資源調査室		
処理	粉末プレス・ビード・溶液		
測定装置	理学電機. IKF—3064		
条件	Rh管球 40 KV, 50 mA. VAC・AIR		
感度	2×10³ cps 4 °/min / sec 4 cm/min		
結晶	LiF	検出器	SD・PC
取扱者	(N)	日付	4.11
備考	Br—微量検出 U—不検出 (0.01%以下) Cu.Ni.Fe…Blank		

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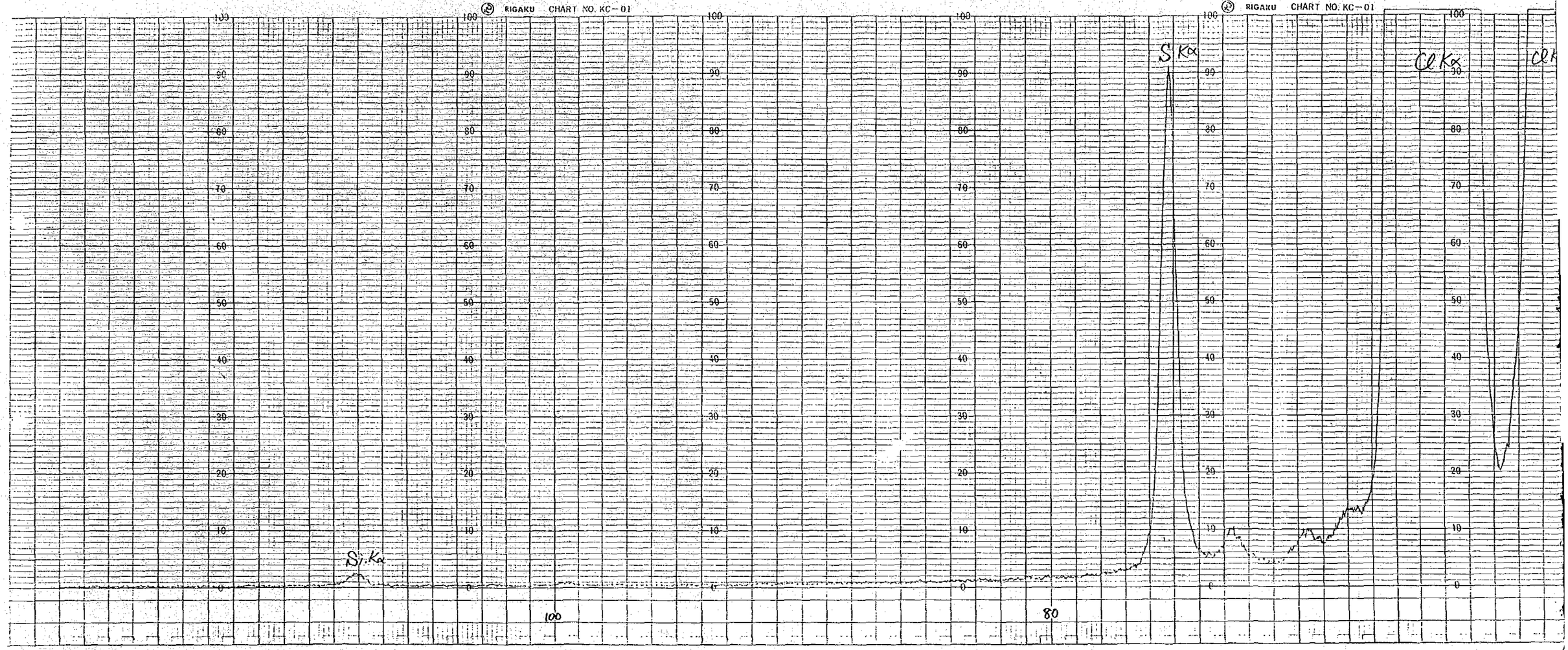
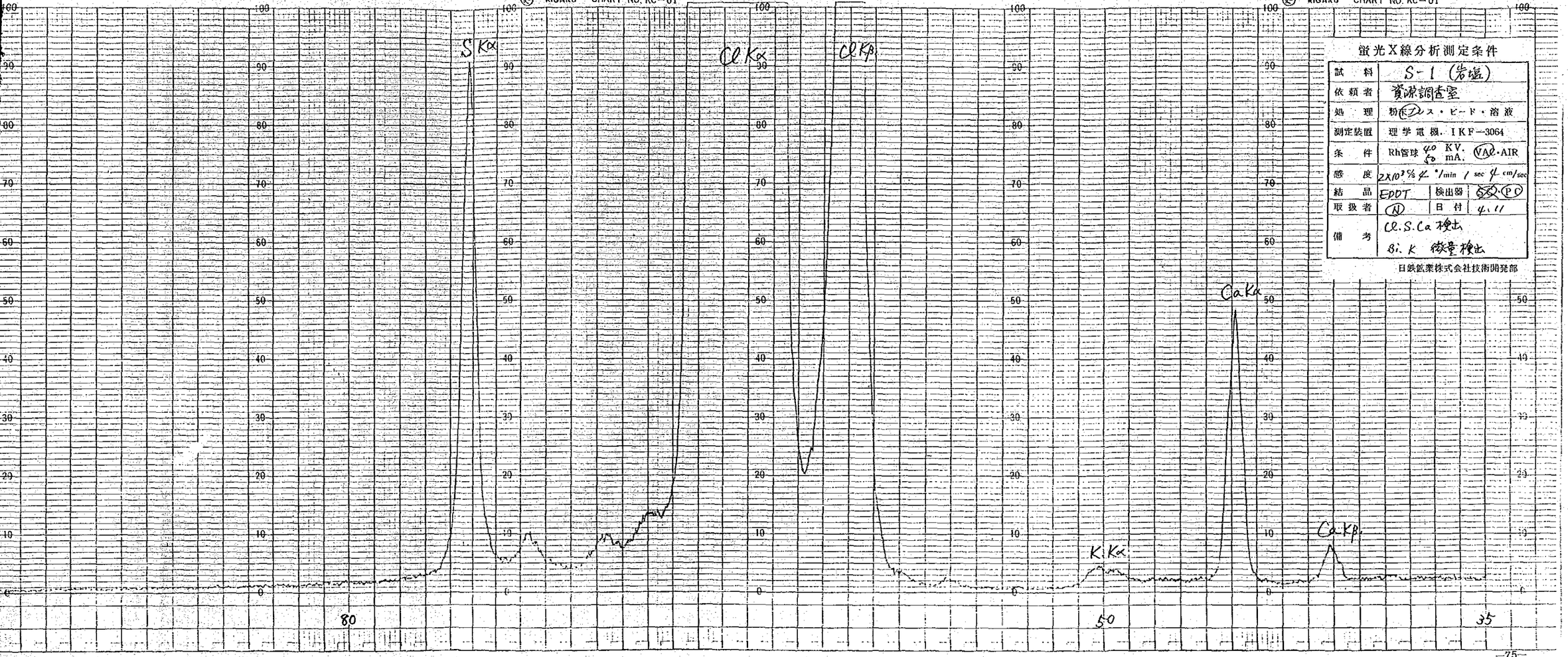

RIGAKU CHART NO. KC-01
100
90
80
70
60
50
40
30
20
10
0
Si Kα
100
RIGAKU CHART NO. KC-01
S Kα
Cl Kα
80

RIGAKU CHART NO. KC-01



RIGAKU CHART NO. KC-01

蛍光X線分析測定条件

試料	S-1 (岩塩)		
依頼者	資源調査室		
処理	粉末プレス・ビード・溶液		
測定装置	理学電機. IKF-3064		
条件	Rh管球 40 KV. 50 mA. (VAC)・AIR		
感度	2×10^{3} ⅛ °/min 1 sec ¼ cm/sec		
結晶	EDDT	検出器	(SC)・(PC)
取扱者	(N)	日付	4.11
備考	Cl. S. Ca 検出 Si. K 微量検出		

日鉄鉱業株式会社技術開発部

RIGAKU CHART NO. KC-01

RIGAKU CHART NO. KC-01

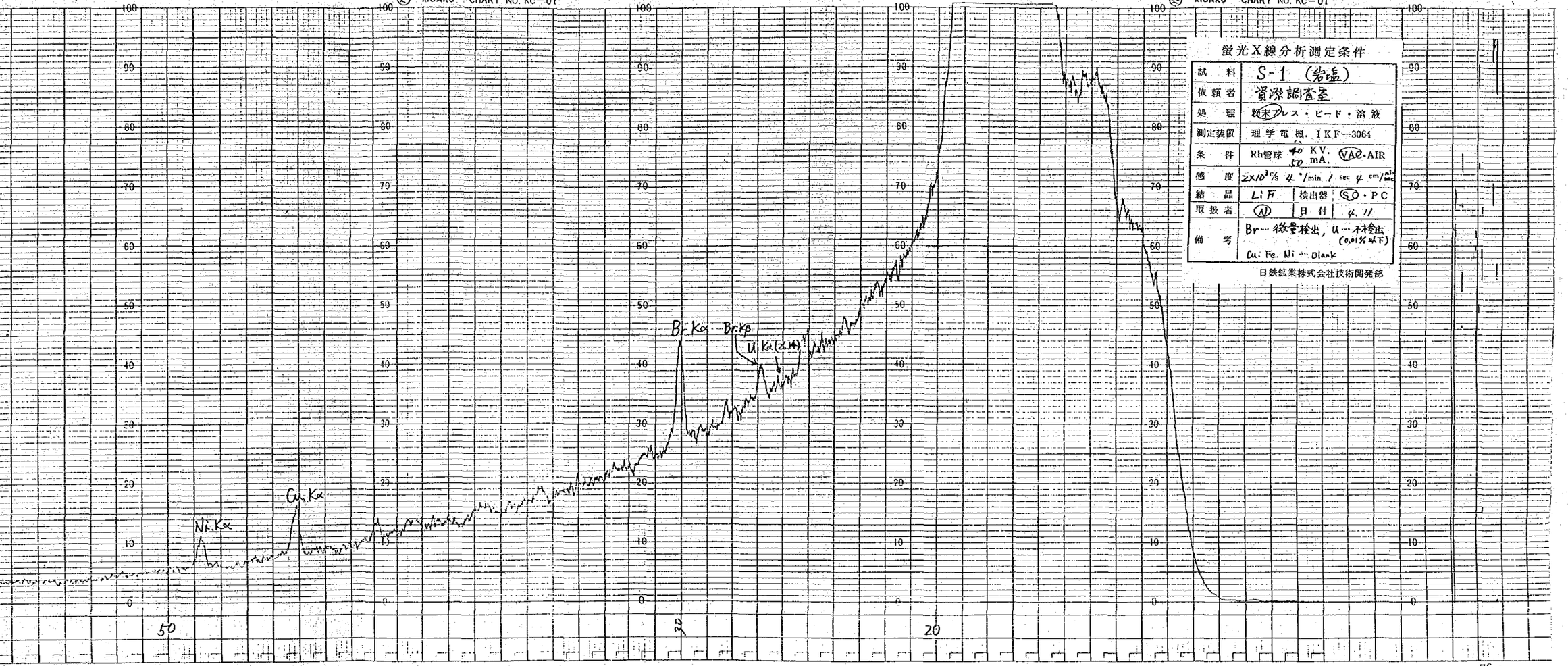
Fe Kα

Ni Kα

Cu Kα

50

RIGAKU CHART NO. KC-01



RIGAKU CHART NO. KC-01

螢光X線分析測定条件

試料	S-1 (岩塩)		
依頼者	資源調査室		
処理	粉末・プレス・ビード・溶液		
測定装置	理学電機, IKF-3064		
条件	Rh管球 40 KV, 50 mA, VAC・AIR		
感度	2×10³ c/s μ °/min / sec μ cm/cm²		
結晶	LiF	検出器	SC・PC
取扱者	W	日付	〃
備考	Br…微量検出, U…不検出 (0.01%以下) Cu. Fe. Ni … Blank		

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