

## 東北日本に産する高压変成岩類の K-Ar 年代値データベース： 辻森・八木 (2014) の補記

辻森 樹<sup>1)</sup>・八木 公史<sup>2)</sup>

**要旨** 東北日本 (棚倉構造線よりも東側) 産の高压変成岩類から報告されている K-Ar (および, Ar/Ar) 年代を地質単元毎にコンパイルし, その年代値を辻森・八木 (2014) が公開したデータベース「karsheet」に追加した。

キーワード: K-Ar 年代, Ar/Ar 年代, 高压変成岩, 東北日本, データベース

### 1. はじめに

辻森・八木 (2014) は, 西南日本の高压変成帯と弱変成付加体から報告されている 1000 個を越える K-Ar (および, Ar/Ar) 年代値をコンパイルし, それをデータファイルとして公開した。本稿はその補記として, 東北日本 (棚倉構造線よりも東側) の高压変成岩類から報告されている K-Ar 系年代値をデータベースに加える。高压変成岩類の鉱物 K-Ar 系放射年代の地質学的意味についての簡単な解説は辻森・八木 (2014) を参照されたい。

### 2. データソースの概要

東北日本には北上山地・阿武隈山地の宮守-早池峰帯に点在するいわゆる松ヶ平-母体変成岩類 (本稿では根田茂帯に伴う高压変成岩類もこれに含めた) (例えば, 前川, 1988; 内野・川村, 2006) のほか, 北海道中軸部の神居古潭変成帯と北海道東部の常呂帯に藍閃変成作用を被った高压変成岩類が分布する (例えば, 鈴木, 1932; Sakakibara, 1986)。1960 年代以降, 主として白雲母 (フェンジャイト) の K-Ar 系年代が常呂帯を除いて報告されてきた。本稿でコンパイルした年代値は全て既存の学術論文から抽出した (付録参照)。年代値は白雲母 (フェンジャイト) 年代を主に, ホルンブレンド年代と黒雲母年代を含む。データは地質単元毎 (宮守-早池峰帯及び, 神居古潭変成帯) の表に

まとめ (表 14 - 15; 表 1 - 13 は, 辻森・八木 (2014) 参照), 辻森・八木 (2014) の Excel シート (karsheet\_swj\_v1) に追記した。東北日本のデータの統合を機に, Excel シートのファイル名を karsheet\_v2 と更新して株式会社蒜山地質年代学研究所 Web サイトにて公開した (<http://geohiruzen.co.jp/>)。コンパイルした年代データは年代値の他に, 年代測定した鉱物のカリウム濃度を含む。アルゴン同位体組成は省略した。後者は年代値が掲載されたオリジナルの論文を参照されたい。1977 年以前の年代は Steiger and Jäger (1977) の壊変常数で再計算した。

### 引用文献

- 前川寛和 (1988) 東北日本の低温高压型変成岩類: 母体-松ヶ平帯. *地球科学*, **42**, 212-219.
- Sakakibara, M. (1986) A newly discovered high-pressure terrane in eastern Hokkaido, Japan. *Journal of Metamorphic Geology*, **4**, 401-408.
- Steiger, R.H. and Jäger, E. (1977) Subcommittee on Geochronology: convention on the use of decay constants in geo- and cosmochronology. *Earth and Planetary Science Letters*, **36**, 359-362.
- 鈴木 醇 (1932) 北海道に於ける藍閃片岩類の原産地. *地質学雑誌*, **39**, 132-137.
- 辻森 樹・八木公史 (2014) 西南日本に産する高压変成岩類の K-Ar 年代値データベース. *地質技術*, **4**, 29-53.

Engineering Geology of Japan, No. 5, 'The special issue of 20<sup>th</sup> anniversary of Hiruzen Institute for Geology and Chronology', 73-76 (2015)

Database of K-Ar ages reported from high-pressure metamorphic rocks in NE Japan: An addition for the *karsheet* database

Tatsuki Tsujimori<sup>1)</sup> and Koshi Yagi<sup>2)</sup>

tatsukix@mac.com

<sup>1)</sup> Institute for Study of the Earth's Interior, Okayama University, 827 Yamada, Misasa-cho, Tottori 682-0193, Japan

<sup>2)</sup> Hiruzen Institute for Geology and Chronology, Co., Ltd., 2-5 Nakashima, Naka-ku, Okayama 703-8252, Japan

<sup>1)</sup> 岡山大学地球物質科学研究センター  
〒682-0193 鳥取県東伯郡三朝町山田 827

<sup>2)</sup> 株式会社蒜山地質年代学研究所  
〒703-8252 岡山市中区中島 2 番地 5

2015 年 5 月 27 日受付, 2015 年 6 月 11 日受理. © 2015 Hiruzen Institute for Geology and Chronology. All rights reserved.

内野隆之・川村信人 (2006) 根田茂帯 (旧 “早池峰帯”) から発見された藍閃石を含む苦鉄質片岩とその意義. 地質学雑誌, 112, 478-481.

表 14 宮守—早池峰帯の高圧変成岩類 (根田茂帯に伴うものも含む) から報告されている K-Ar および Ar/Ar 年代値.

ref	sample No.	rock type	mineral	K (wt%)	error (wt%)	Age (Ma)	error (Ma)	area	grade	note
<b>Kawano and Ueda (1965)</b>										
	S-159	gernet amphibolite	phengite	5.76	—	<b>300</b>	—	Yamagami		
<b>Kanisawa et al. (1992)</b>										
	YM-1	amphibolite	hornblende	0.14 0.13	—	<b>495</b>	25	Matsugadaira		
	YM-2	gernet amphibolite	hornblende	0.21 0.22	—	<b>225</b>	11	Yamagami		
	YM-3	gernet amphibolite	hornblende	0.19 0.19	—	<b>239</b>	12	Yamagami		
<b>Kawamura et al. (2007)</b>										
	20050610L6-1	mafic schist	phengite	Ar/Ar		<b>382.7</b>	1.3	Tateishi Schists, Nedamo	plateau	<b>386.2</b> 1.4
	20050610L6-2	mafic schist	phengite	Ar/Ar		<b>376.0</b>	1.6	Tateishi Schists, Nedamo		<b>379.4</b> 1.8
	20050610L6-3	mafic schist	phengite	Ar/Ar		<b>379.3</b>	1.5	Tateishi Schists, Nedamo		<b>383.3</b> 1.6
	20050510-1	garnet-quartz-muscovite schist	phengite	Ar/Ar		<b>364.3</b>	1.7	Tateishi Schists, Nedamo		<b>366.8</b> 1.7
	20050510-2	garnet-quartz-muscovite schist	phengite	Ar/Ar		<b>353.9</b>	2.1	Tateishi Schists, Nedamo		— —
	20050510-3	garnet-quartz-muscovite schist	phengite	Ar/Ar		<b>375.4</b>	1.8	Tateishi Schists, Nedamo		<b>379.9</b> 1.9
<b>Uchino et al. (2008)</b>										
	a	garnet-bearing pelitic schist pebble	phengite	Ar/Ar		<b>324.6</b>	13.8	Tateishi Schists, Nedamo		
	b	garnet-bearing pelitic schist pebble	phengite	Ar/Ar		<b>316.9</b>	14.7	Tateishi Schists, Nedamo		
	c	garnet-bearing pelitic schist pebble	phengite	Ar/Ar		<b>347.1</b>	11.6	Tateishi Schists, Nedamo		

表 15 神居古潭変成帯から報告されている K-Ar および Ar/Ar 年代値.

ref	sample No.	rock type	mineral	K (wt%)	error (wt%)	Age (Ma)	error (Ma)	area	grade	note
<b>Bikerman et al. (1971)</b>										
—		garnet amphibolite	phengite	8.13	0.02	111	6	Mitsuishi		
—		garnet amphibolite	hornblende	0.94	0.01	124	6	Mitsuishi		
<b>Imaizumi and Ueda (1981)</b>										
	52091001	quartz schist	phengite	5.64	—	116	—	Numaushi schists, Horokanai		
	50081119	quartz schist	phengite	5.43	—	107	—	Numaushi schists, Horokanai		
	52082401	psammitic schist	phengite	3.76	—	72	—	Takadomari schists, Horokanai		
	50082102	psammitic schist	phengite	6.42	—	135	—	Takadomari schists, Horokanai		
	52081802	mafic schist	phengite	7.80	—	132	—	Tectonic blocks, Horokanai		
	52082802	mafic schist	phengite	8.18	—	145	—	Tectonic blocks, Horokanai		
<b>Nakagawa and Nakano (1987)</b>										
—		mafic schist	phengite	5.55 5.57	— —	125	6	Mitsuishi River		
<b>Shibakusa and Itaya (1992)</b>										
	8781701	mafic schist	phengite	6.74	0.14	125.3	2.7	Horokanai-Kamietanbetsu	zone II	
	8781705	pelitic schist	phengite	6.22	0.12	120.5	2.6	Horokanai-Kamietanbetsu	zone II	
	6782121	mafic schist	phengite	7.25	0.15	129.8	2.8	Horokanai-Kamietanbetsu	zone III	
	67T82101	mafic schist	phengite	7.81	0.16	133.9	2.9	Horokanai-Kamietanbetsu	zone III	
<b>Ota et al. (1993)</b>										
	3	pelitic schist	phengite	4.06	0.08	102.8	2.2	Horokanai-Kamietanbetsu		
	5	pelitic schist	phengite	6.37	0.13	81.7	1.8	Kamuikotan gorge		
	6	pelitic schist	phengite	6.23	0.13	62.2	1.4	Kamuikotan gorge		
	7	pelitic schist	phengite	6.55	0.13	73.5	1.6	Kamuikotan gorge		
	8	pelitic schist	phengite	6.77	0.14	74.0	1.6	Kamuikotan gorge		
	9	pelitic schist	phengite	5.94	0.12	84.1	1.9	Kamuikotan gorge		
	10	pelitic schist	phengite	6.64	0.13	91.2	2.0	Kamuikotan gorge		
	12	pelitic schist	phengite	4.24	0.09	100.8	2.2	Niniu		
	13	pelitic schist	phengite	6.23	0.13	100.3	2.2	Niniu		
	16	pelitic schist	phengite	5.95	0.12	107.6	2.3	Mitsuishi		
	4a (95-161 $\mu$ m)	quartz schist	phengite	5.66	0.11	101.9	2.2	Horokanai-Kamietanbetsu		
	4b (70-95 $\mu$ m)	quartz schist	phengite	4.40	0.09	101.4	2.2	Horokanai-Kamietanbetsu		
	4c (48-70 $\mu$ m)	quartz schist	phengite	3.09	0.06	103.8	2.3	Horokanai-Kamietanbetsu		
	11	quartz schist	phengite	5.40	0.11	107.1	2.3	Kamuikotan gorge		
	14	quartz schist	phengite	5.68	0.11	113.8	2.6	Shizunai		
	15	quartz schist	phengite	6.44	0.13	124.1	2.7	Mitsuishi		
	2	amphibolite	phengite	6.07	0.12	123.2	2.7	tectonic blocks in serpentinite, Horokanai-Kamietanbetsu		
	17	amphibolite	hornblende	0.347	0.017	125.8	6.2	tectonic blocks in serpentinite, Mitsuishi		
<b>Iwasaki et al. (1995)</b>										
	MG5-09	pelitic schist	phengite	4.23	0.09	59.5	1.3	Kamuyama greenstone unit		
	OW1-02	pelitic schist	phengite	6.55	0.13	61.6	1.4	Kamuyama greenstone unit		
	ORW-01	meta hyaloclastite	biotite	6.14	0.12	47.6	1.1	Orochon serpentinite melange unit		
	ORW-02	meta hyaloclastite	biotite	6.16	0.12	45.8	1.0	Orochon serpentinite melange unit		
	WPI-01	pelitic schist	phengite	5.51	0.11	58.8	1.3	Orochon serpentinite melange unit		
	AP-02	pelitic schist	phengite	6.07	0.12	62.9	1.6	Orochon serpentinite melange unit		
	90102303	pelitic schist	phengite	5.51	0.11	72.8	1.6	Orowen serpentinite melange unit		
	90102506	pelitic schist	phengite	5.99	0.12	59.8	1.3	Orowen serpentinite melange unit		
	90102512	pelitic schist	phengite	6.37	0.13	73.6	2.1	Orowen serpentinite melange unit		
	90102902	pelitic schist	phengite	2.47	0.05	70.1	1.5	Orowen serpentinite melange unit		
	90110307	pelitic schist	phengite	5.00	0.10	65.9	1.4	Orowen serpentinite melange unit		
	91100703	pelitic schist	phengite	4.19	0.08	68.9	1.5	Orowen serpentinite melange unit		
	91100906a	pelitic schist	phengite	6.14	0.12	71.8	1.6	Orowen serpentinite melange unit		
	IW6	pelitic schist	phengite	3.12	0.06	68.4	1.5	Orowen serpentinite melange unit		
	91100902d	pelitic schist	phengite	6.70	0.13	63.5	1.4	Orowen serpentinite melange unit		
	ME1	pelitic schist	phengite	7.01	0.14	64.2	1.4	Orowen serpentinite melange unit		
	91052003	pelitic schist	phengite	5.85	0.12	62.8	1.6	Pankehoronai pelitic schist unit		
	IU4	pelitic schist	phengite	3.40	0.07	51.3	1.1	Pankehoronai pelitic schist unit		
	IU21	pelitic schist	phengite	5.55	0.11	66.8	1.5	Pankehoronai pelitic schist unit		
	ME22	pelitic schist	phengite	4.15	0.08	57.7	1.3	Pankehoronai pelitic schist unit		
	ME31a	pelitic schist	phengite	5.24	0.11	57.0	1.4	Pankehoronai pelitic schist unit		
	9100802	pelitic schist	phengite	6.87	0.14	57.9	1.3	Pankehoronai pelitic schist unit		
	PU5	pelitic schist	phengite	7.79	0.16	66.0	1.4	Pankehoronai pelitic schist unit		
	91101201	pelitic schist	phengite	5.67	0.11	58.1	1.3	Pankehoronai pelitic schist unit		
	K17	pelitic schist	phengite	6.07	0.12	56.6	1.2	Pankehoronai pelitic schist unit		
	K125	pelitic schist	phengite	4.48	0.09	65.5	1.4	Pankehoronai pelitic schist unit		
	K149	pelitic schist	phengite	7.17	0.14	62.8	1.4	Pankehoronai pelitic schist unit		
	PU16	pelitic schist	phengite	5.61	0.11	51.0	1.1	Pankehoronai pelitic schist unit		
						total gas			plateau <sup>1</sup>	plateau <sup>2</sup>
	PU16	pelitic schist	phengite	Ar/Ar		53.5	—	Pankehoronai pelitic schist unit	54	58
	PU20 (150-200)	pelitic schist	phengite	7.29	0.15	57.0	1.4	Pankehoronai pelitic schist unit		
	PU20 (200-250)	pelitic schist	phengite	7.16	0.14	56.7	1.4	Pankehoronai pelitic schist unit		
	PU20 (250-325)	pelitic schist	phengite	4.97	0.10	57.3	1.4	Pankehoronai pelitic schist unit		
	PU26 (150-200)	pelitic schist	phengite	6.84	0.14	57.9	1.4	Pankehoronai pelitic schist unit		
	PU26 (200-250)	pelitic schist	phengite	5.64	0.11	58.0	1.4	Pankehoronai pelitic schist unit		
	PU26 (250-325)	pelitic schist	phengite	4.23	0.09	57.7	1.4	Pankehoronai pelitic schist unit		
	PU34	pelitic schist	phengite	3.92	0.08	60.9	1.3	Pankehoronai pelitic schist unit		
	91101404	pelitic schist	phengite	3.52	0.07	52.8	1.2	Pankehoronai pelitic schist unit		
	PS13	pelitic schist	phengite	5.06	0.10	57.2	1.3	Pankehoronai pelitic schist unit		
	PS34	pelitic schist	phengite	6.91	0.14	68.4	1.5	Pankehoronai pelitic schist unit		
	LO17	pelitic schist	phengite	3.06	0.06	55.6	1.2	Pankehoronai pelitic schist unit		
	PU45	pelitic schist	phengite	6.03	0.12	64.7	1.4	Pankehoronai pelitic schist unit		
	91101604	pelitic schist	phengite	5.28	0.11	59.2	1.3	Pankehoronai pelitic schist unit		
	PU54	pelitic schist	phengite	4.67	0.09	72.8	1.6	Pankehoronai pelitic schist unit		
	91101609	pelitic schist	phengite	4.24	0.09	62.4	1.4	Pankehoronai pelitic schist unit		
	PU63	pelitic schist	phengite	5.42	0.11	71.8	1.6	Pankehoronai pelitic schist unit		
	91101705	pelitic schist	phengite	6.93	0.14	62.2	1.4	Pankehoronai pelitic schist unit		
	PU68	pelitic schist	phengite	4.58	0.09	62.7	1.4	Pankehoronai pelitic schist unit		
	91050403	pelitic schist	phengite	7.97	0.16	68.5	1.5	Pankehoronai pelitic schist unit		
	91050402	pelitic schist	phengite	5.93	0.12	63.8	1.4	Pankehoronai pelitic schist unit		

1. 760-920°C; 2. 1000-1200°C

付録 K-Ar (および, Ar/Ar) 年代値を収集した文献 (アルファベット順). 和文の文献については英語情報で記した.

- Bikerman, M., Minato, M. and Hunahashi, M. (1971) K-Ar age of the garnet amphibolite of the Mitsuishi district, Hidaka province, Hokkaido, Japan. *Earth Science (Chikyu Kagaku)*, **25**, 27-30.
- Imaizumi, M. and Ueda, Y. (1981) On the K-Ar ages of the Rocks of two kinds existed in the Kamuikotan metamorphic rocks located in the Horokanai district, Hokkaido. *Journal of the Japanese Association of Mineralogists, Petrologists and Economic Geologists*, **76**, 88-92 (in Japanese with English abstract).
- Iwasaki, I., Watanabe, T., Itaya, T., Yamazaki, M. and Takigami, Y. (1995) Palaeogene K-Ar ages from the Kamuikotan metamorphic rocks, southern area of the Kamuikotan Gorge, central Hokkaido, northern Japan. *Geological Journal*, **30**, 281-295.
- Kanisawa, S., Ehiro, M. and Okami, K. (1992) K-Ar ages of amphibolites from the Matsugadaira-Motai metamorphics and their significance. *Journal of Mineralogy, Petrology and Economic Geology*, **87**, 412-419 (in Japanese with English abstract).
- Kawamura, M., Uchino, T., Gouzu, C. and Hyodo, H. (2007) 380 Ma  $^{40}\text{Ar}/^{39}\text{Ar}$  ages of the high-P/T schists obtained from the Nedamo Terrane, Northeast Japan. *The Journal of the Geological Society of Japan*, **113**, 492-499.
- Kawano, Y. and Ueda, Y. (1965) K-Ar dating on the igneous rocks in Japan (III): Granitic rocks in Abukuma massif. *Journal of Japanese Association of Mineralogists, Petrologists and Economic Geologists*, **54**, 162-172 (in Japanese with English abstract).
- Nakagawa, M. and Nakano, N. (1987) K-Ar dating and its significance of Kamuikotan mafic schist from Mitsuishi River, southern central Hokkaido, Japan. *Earth Science (Chikyu Kagaku)*, **41**, 244-247 (in Japanese).
- Ota, T., Sakakibara, M. and Itaya, T. (1993) K-Ar ages of the Kamuikotan metamorphic rocks in Hokkaido, Japan. *The Journal of the Geological Society of Japan*, **99**, 335-345 (in Japanese with English abstract).
- Shibakusa, H. and Itaya, T. (1992) K-Ar ages of glaucophane schists and associated rocks from the Horokanai-Kamietanbetsu area in the Kamuikotan zone, Hokkaido, northern Japan. *The Journal of the Geological Society of Japan*, **98**, 1061-1064.
- Uchino, T., Kawamura, M., Gouzu, C. and Hyodo, H. (2008) Phengite  $^{40}\text{Ar}/^{39}\text{Ar}$  age of garnet-bearing pelitic schist pebble obtained from conglomerate in the Nedamo Terrane, Northeast Japan. *The Journal of the Geological Society of Japan*, **114**, 314-317 (in Japanese with English abstract).