

Data of 3D cathodoluminescence patterns, U-Pb ages, titanium concentration and Th/U with zircon growth in the Okueyama granite, Kyushu, Japan.

## Authors

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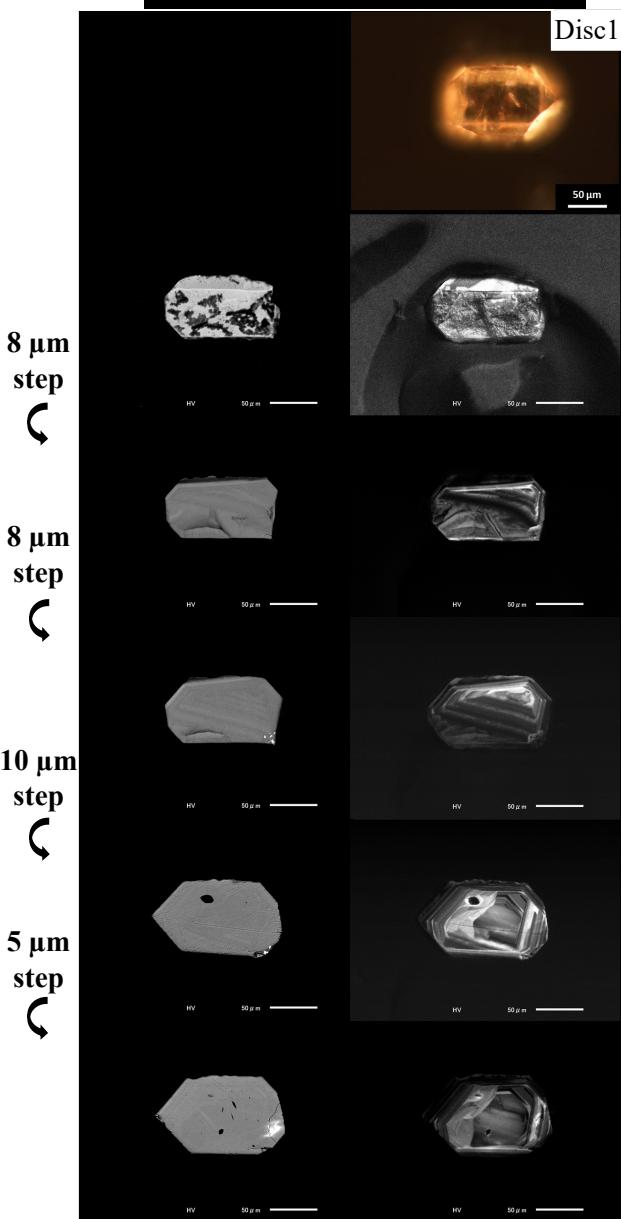
## Keywords

3D cathodoluminescence pattern; Zircon U–Pb age; Titanium concentration; Th/U; Morphology; Okueyama granite

This dataset consists of three-dimensional (3D) cathodoluminescence (CL) patterns, U-Pb ages, titanium concentration and Th/U for elucidating zircon growth processes in a granitic pluton. We focused on the zircon growth processes in the Okueyama granite (OKG), central Kyushu, Japan, to obtain the interpretations of magma chamber processes. The OKG consists of three lithofacies including biotite granite (BG), hornblende granite (HG), and hornblende granodiorite (HGD). Three rock samples were collected from three lithofacies, respectively. The morphological descriptions, 3D cathodoluminescence patterns, U-Pb ages, titanium concentration and Th/U were compiled for all zircon crystals (N = 108) of three samples (Figs. 1-108). In order to achieve 3D internal structure and growth pattern in a zircon crystal, CL observations for the multi sections

with depth intervals of 5–10  $\mu\text{m}$  within a zircon were performed. The 3D distribution of the internal structure of zircon crystals comprises the following five textures: 1) oscillatory zoned (OZ), 2) porous, 3) chaotic, 4) locally disturbed, and 5) crystals with inherited cores. The 3D distribution of the OZ can be used to approximate the location of zircon nucleation. Simultaneous determination of zircon U-Pb age and titanium concentration were carried out for the center section of the zircon. The simultaneous determination also enables us to associate Th/U with temperature.

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

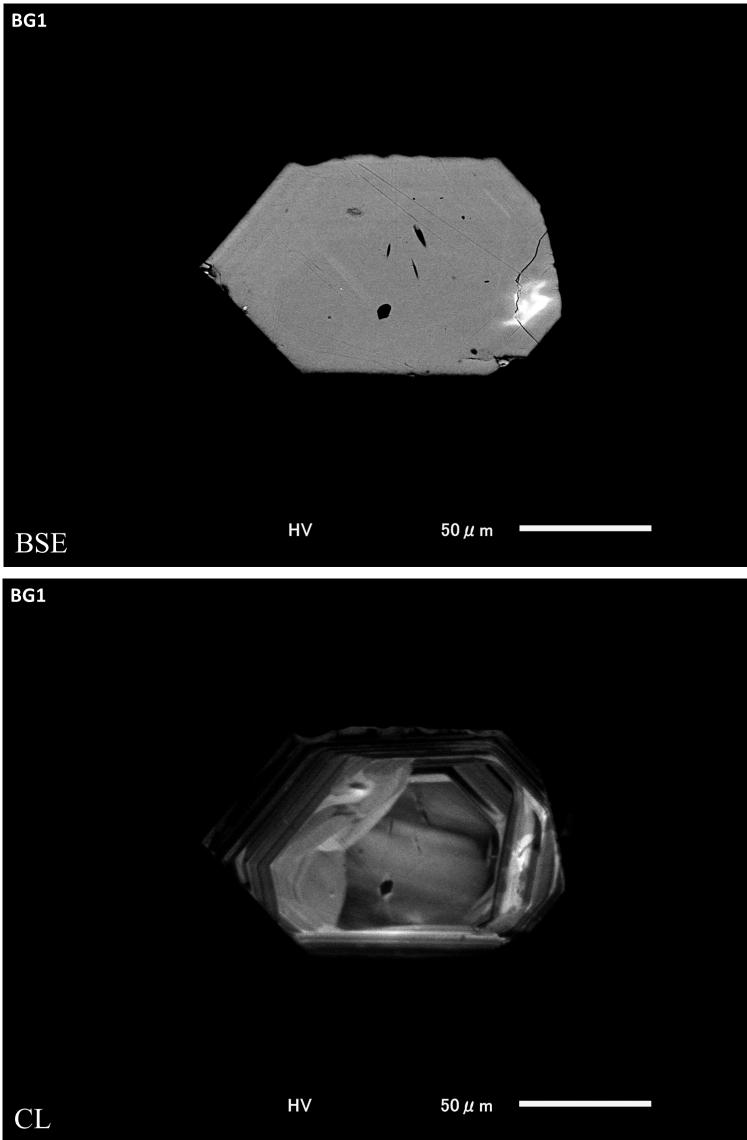
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

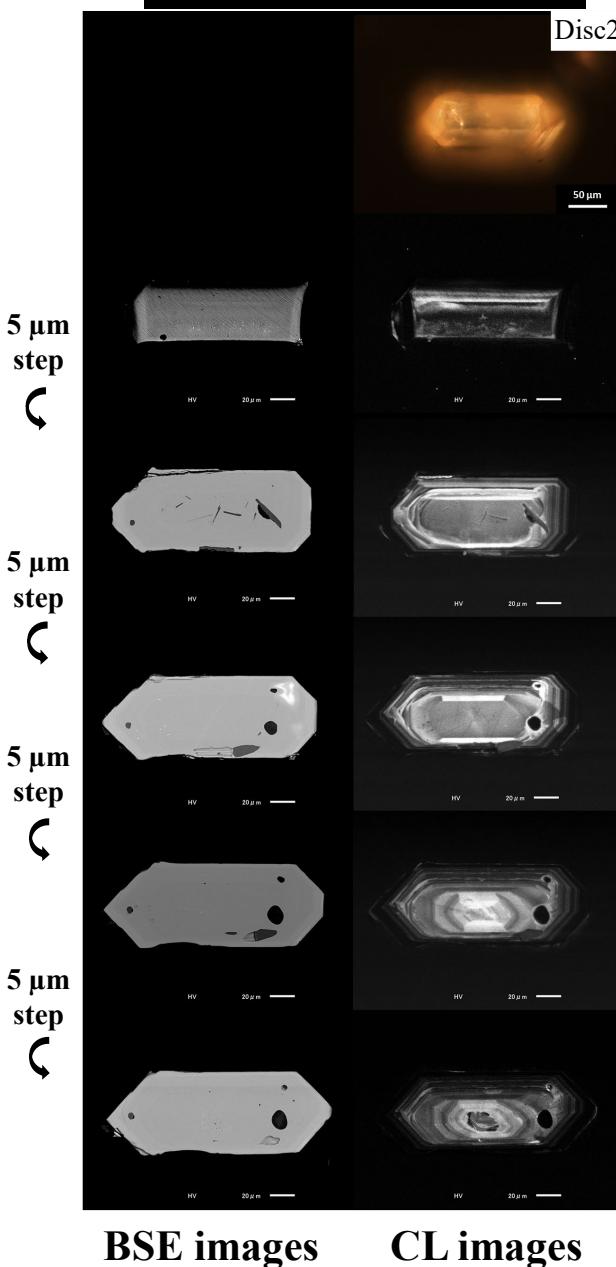
- Type {100}
- Major axis: 142 μm
- Minor axis: 90 μm
- Major axis/Minor axis: 1.6

**Observed internal texture**

- OZ
- LDT

Fig. 1 Zircon data of grain No. BG1

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :

BG2

BSE

CL

BG2-8  
566.8±20.0 Ma  
26.84±1.63 ppm  
0.50±0.04

BG2-9  
37.1±2.6 Ma  
8.51±0.61 ppm  
0.33±0.03

BG2-10  
14.2±1.6 Ma  
7.61±0.55 ppm  
0.55±0.04

BG2-11  
13.9±0.6 Ma  
2.10±0.24 ppm  
0.31±0.02

BG2-8  
566.8±20.0 Ma  
26.84±1.63 ppm  
0.50±0.04

BG2-9  
37.1±2.6 Ma  
8.51±0.61 ppm  
0.33±0.03

BG2-10  
14.2±1.6 Ma  
7.61±0.55 ppm  
0.55±0.04

BG2-11  
13.9±0.6 Ma  
2.10±0.24 ppm  
0.31±0.02

<Legend>

OZ: Oscillatory zoning

PT: Porous texture

CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

## Morphological description

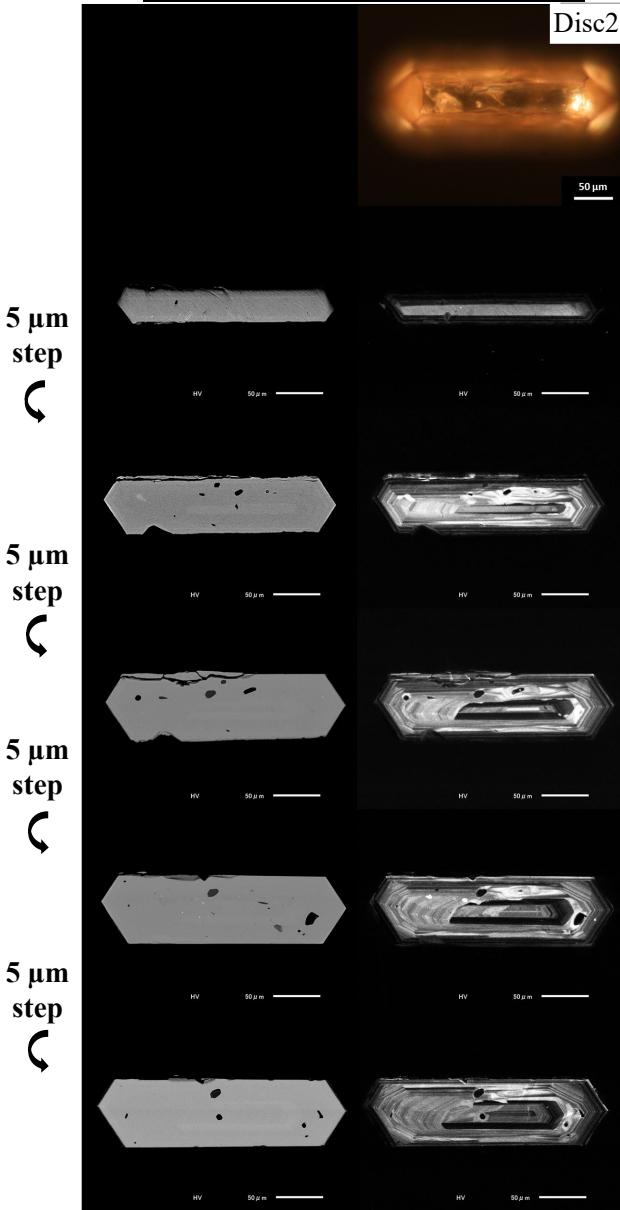
- Type {100}
- Major axis: 181 µm
- Minor axis: 69 µm
- Major axis/Minor axis: 2.6

## Observed internal texture

- OZ
- LDT
- IHC

Fig. 2 Zircon data of grain No. BG2

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :

BG3

BG3-72  
10.6±1.6 Ma  
5.78±0.41 ppm  
0.44±0.05

BG3-73  
13.3±1.8 Ma  
4.60±0.36 ppm  
0.36±0.04

BG3-74  
12.0±1.0 Ma  
5.66±0.40 ppm  
0.63±0.05

BG3-72 BG3-73 BG3-74

BSE

HV

50 μm

BG3

BG3-72  
10.6±1.6 Ma  
5.78±0.41 ppm  
0.44±0.05

BG3-73  
13.3±1.8 Ma  
4.60±0.36 ppm  
0.36±0.04

BG3-74  
12.0±1.0 Ma  
5.66±0.40 ppm  
0.63±0.05

BG3-72 BG3-73 BG3-74

CL

HV

50 μm

**Morphological description**

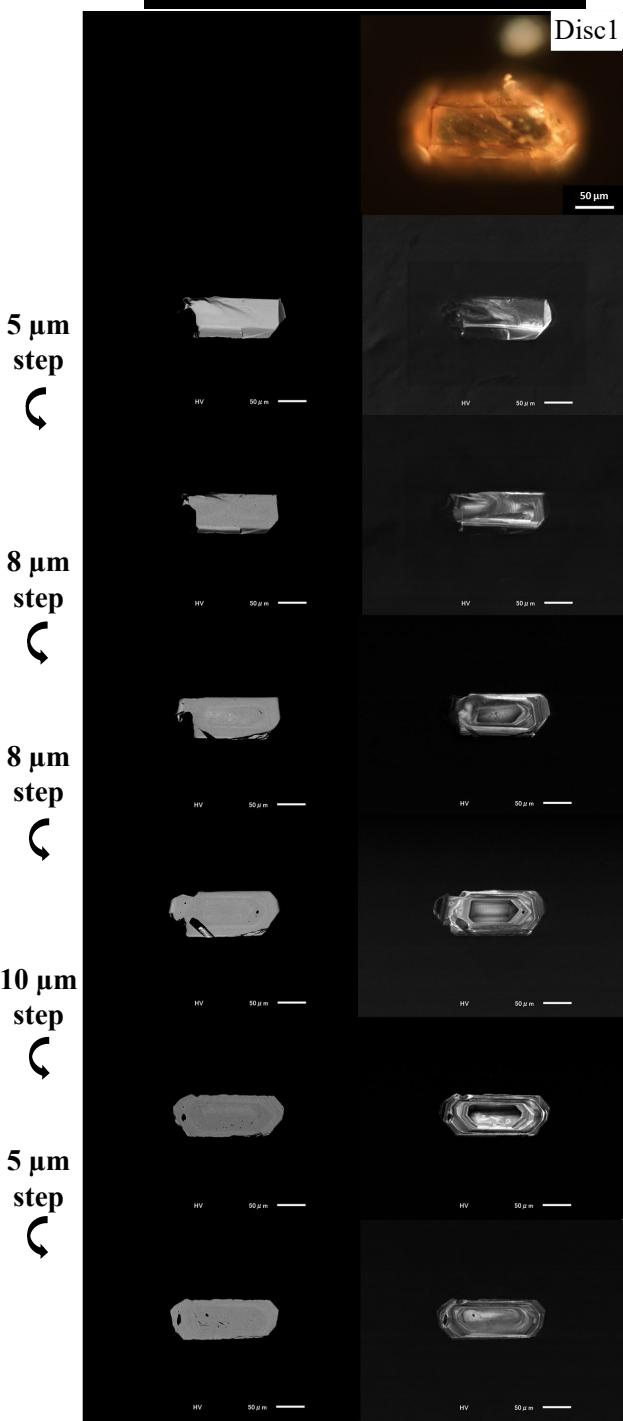
- Type {100}
- Major axis: 295 μm
- Minor axis: 75 μm
- Major axis/Minor axis: 4.0

**Observed internal texture**

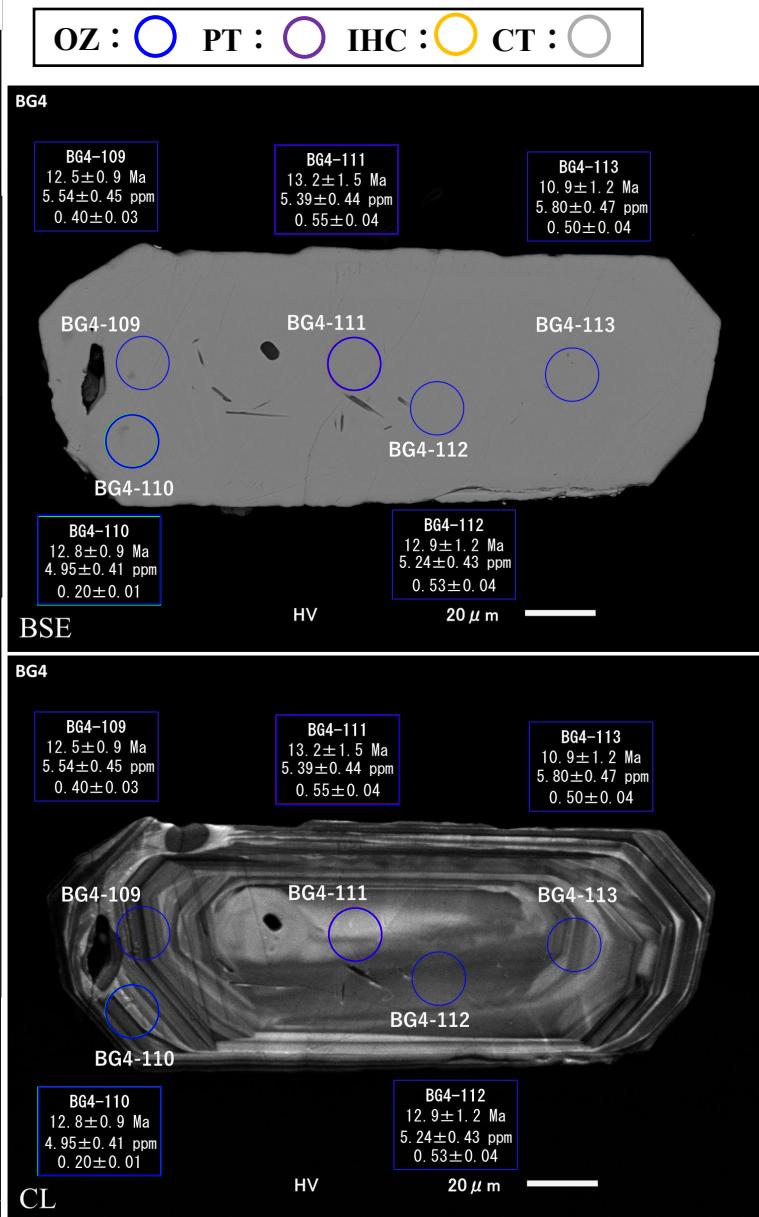
- OZ
- LDT

Fig. 3 Zircon data of grain No. BG3

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio



## Morphological description

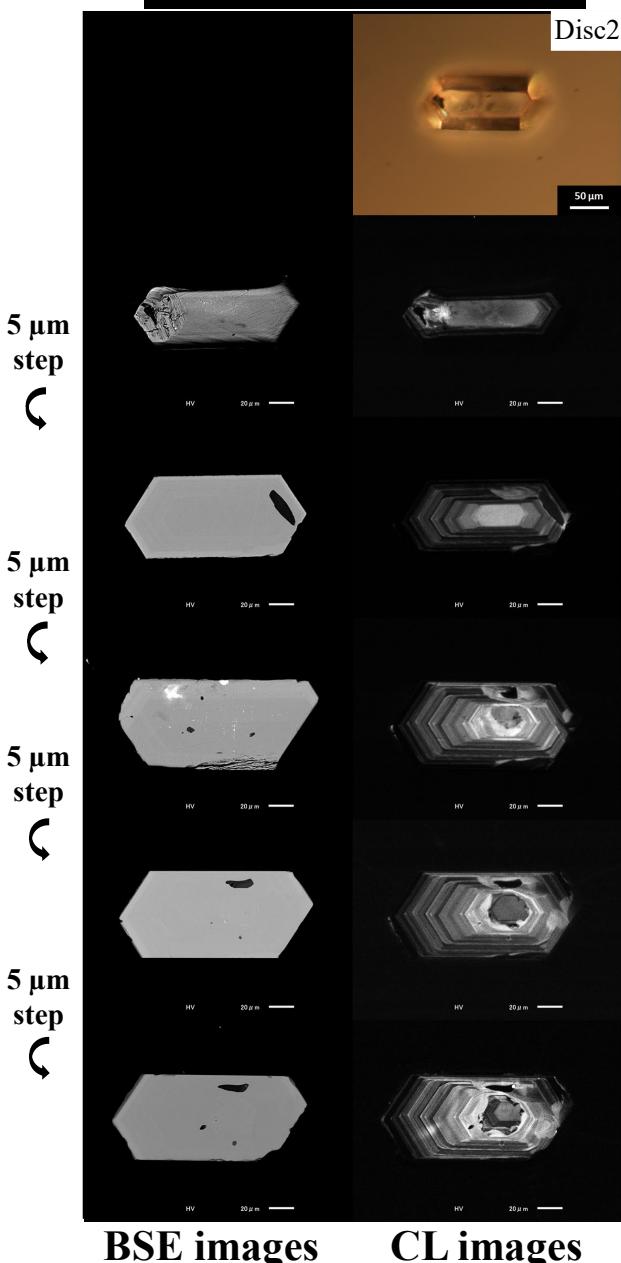
- Type {100}
- Major axis: 209 μm
- Minor axis: 83 μm
- Major axis/Minor axis: 2.5

## Observed internal texture

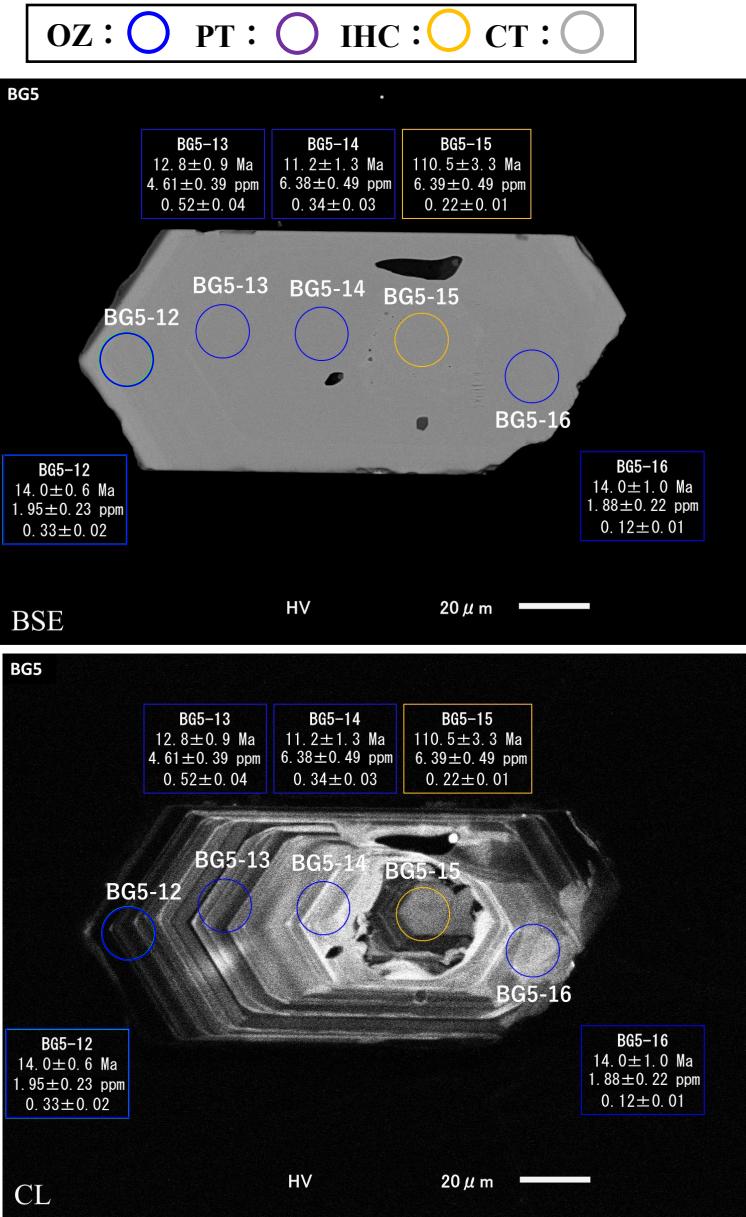
- OZ
- LDT

Fig. 4 Zircon data of grain No. BG4

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio



## <Legend>

OZ: Oscillatory zoning  
 PT: Porous texture  
 CT: Chaotic texture  
 LDT: Local disturbance texture  
 IHC: Inherited core

## Morphological description

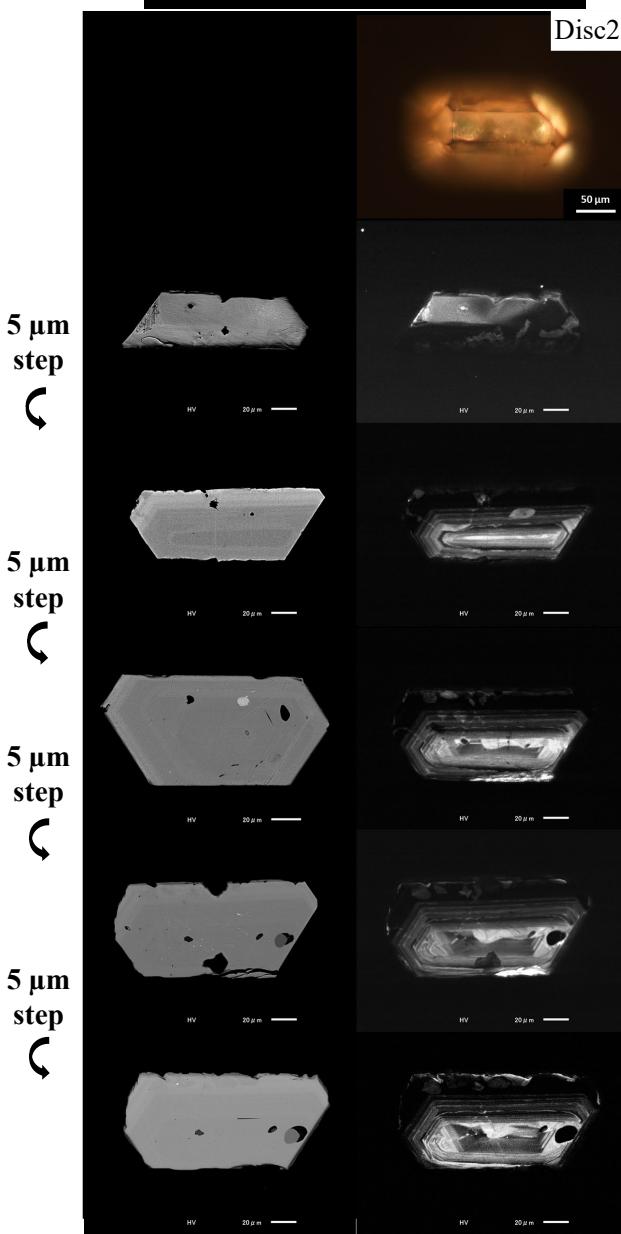
- Type {110}
- Major axis: 164  $\mu$ m
- Minor axis: 70  $\mu$ m
- Major axis/Minor axis: 2.4

## Observed internal texture

- OZ
- LDT
- IHC

Fig. 5 Zircon data of grain No. BG5

## Morphological observation and CL observation for multi-layers



BSE images

CL images

<Legend>

OZ: Oscillatory zoning

PT: Porous texture

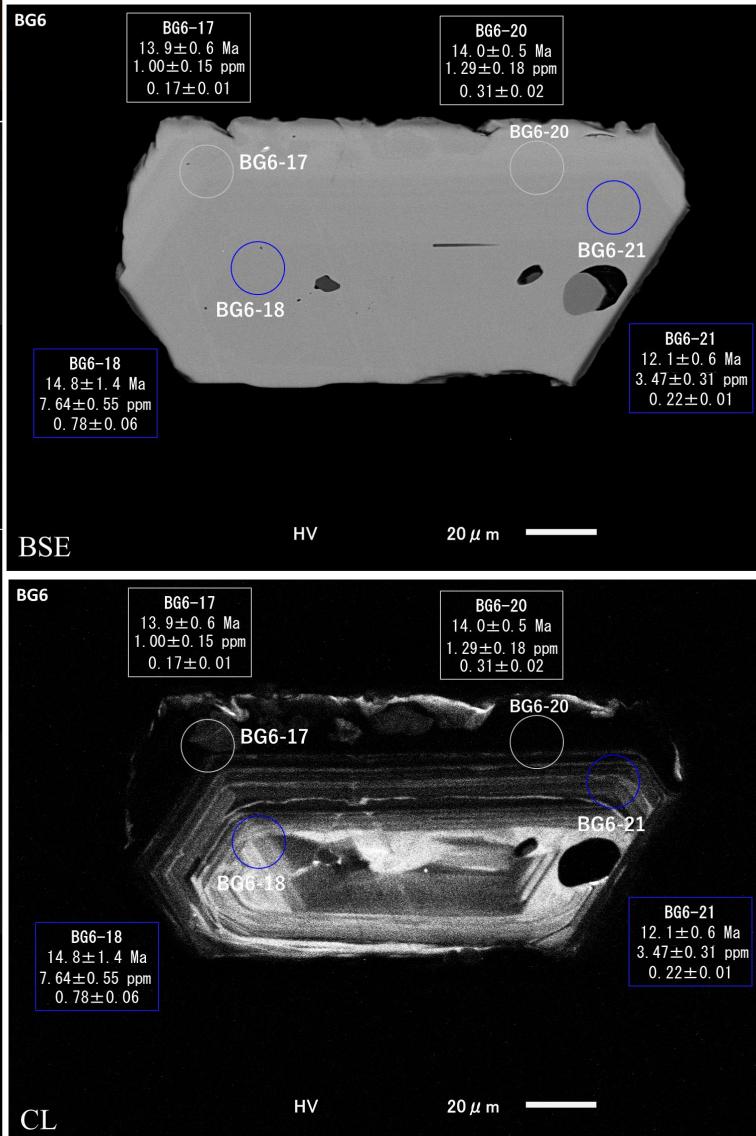
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : ○ PT : ○ IHC : ○ CT : ○



## Morphological description

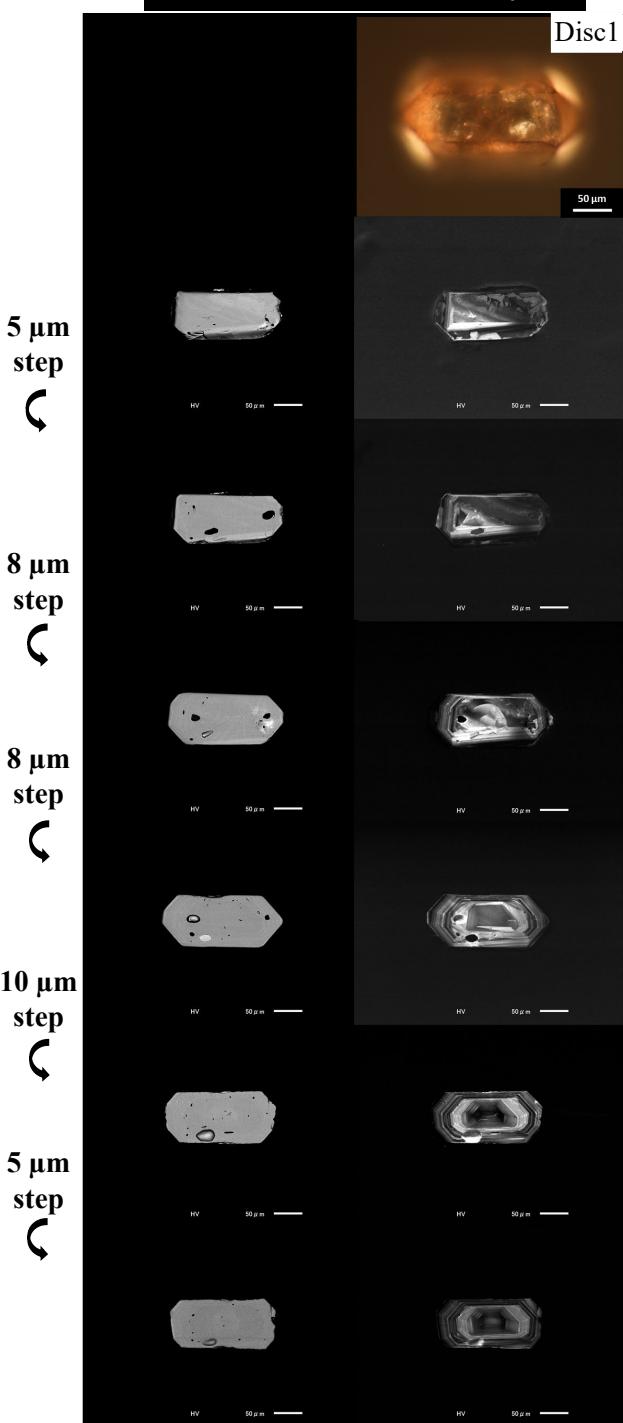
- Type {100}
- Major axis: 167  $\mu$ m
- Minor axis: 67  $\mu$ m
- Major axis/Minor axis: 2.5

## Observed internal texture

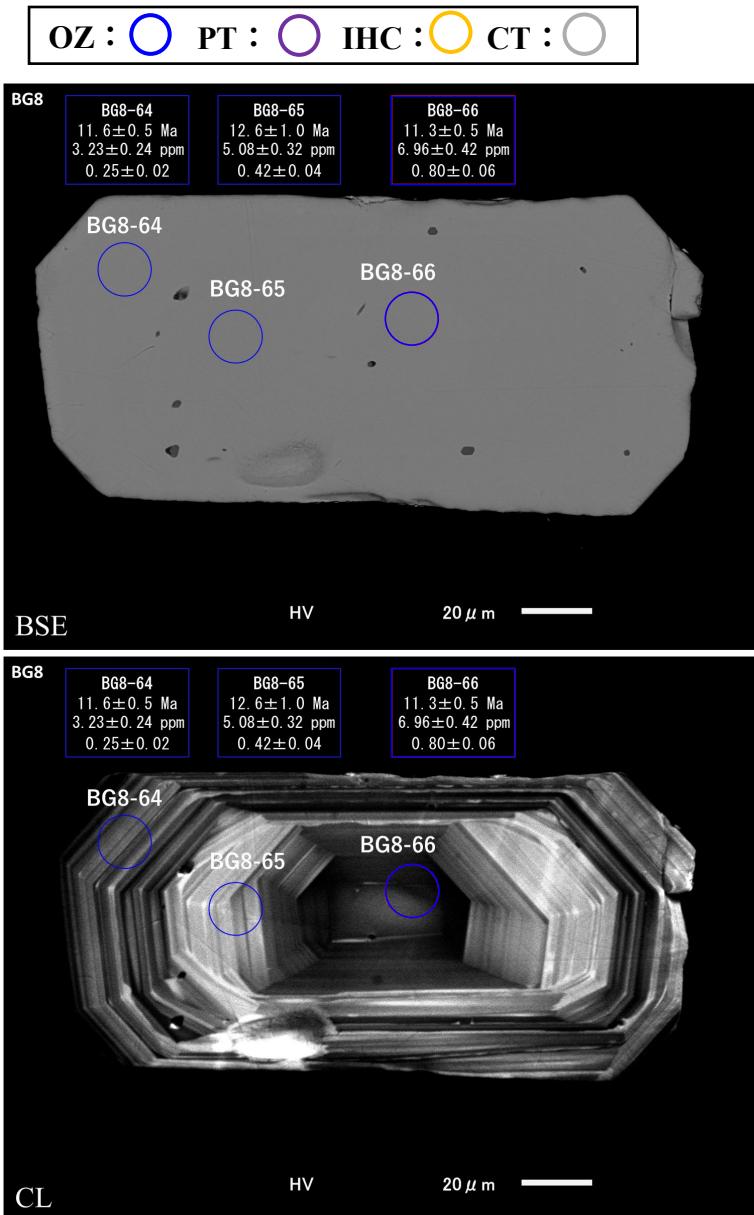
- OZ
- CT
- LDT
- PT

Fig. 6 Zircon data of grain No. BG6

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio



## Morphological description

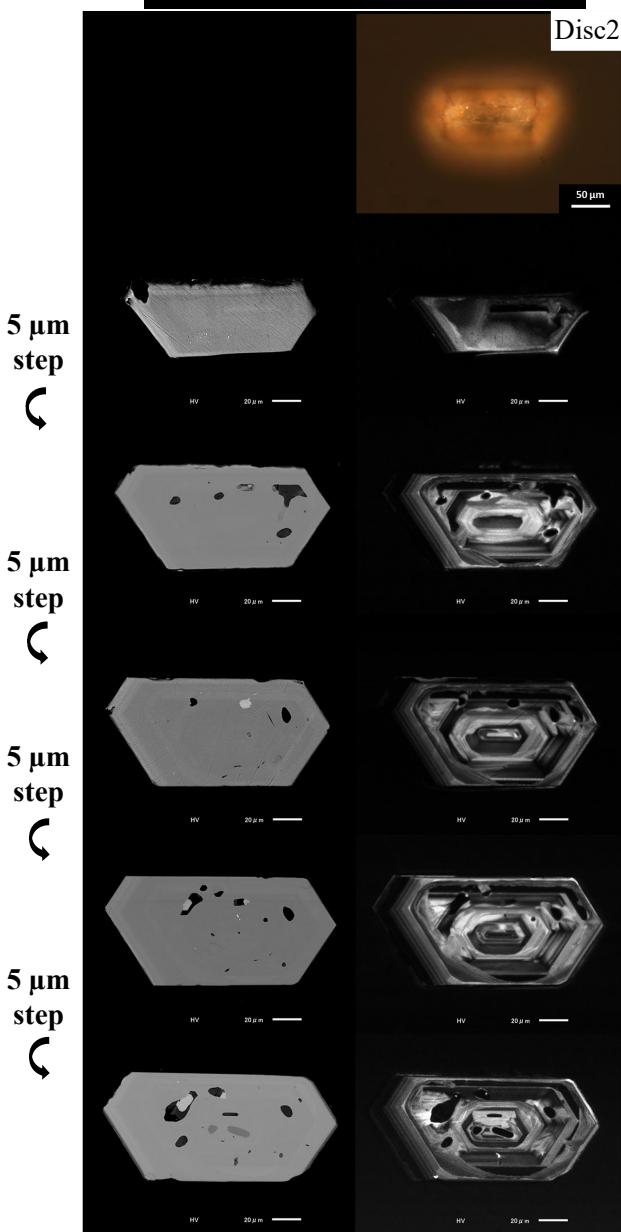
- Type {100}
- Major axis: 237 μm
- Minor axis: 101 μm
- Major axis/Minor axis: 2.3

## Observed internal texture

- OZ
- LDT

Fig. 7 Zircon data of grain No. BG8

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

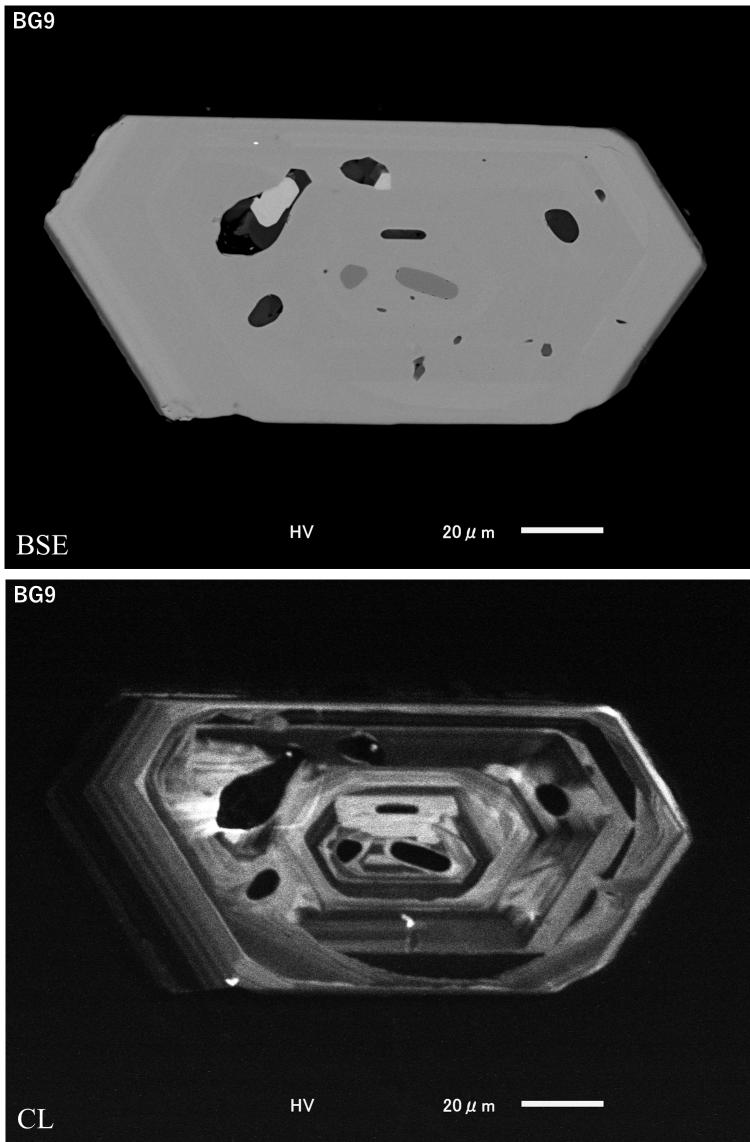
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

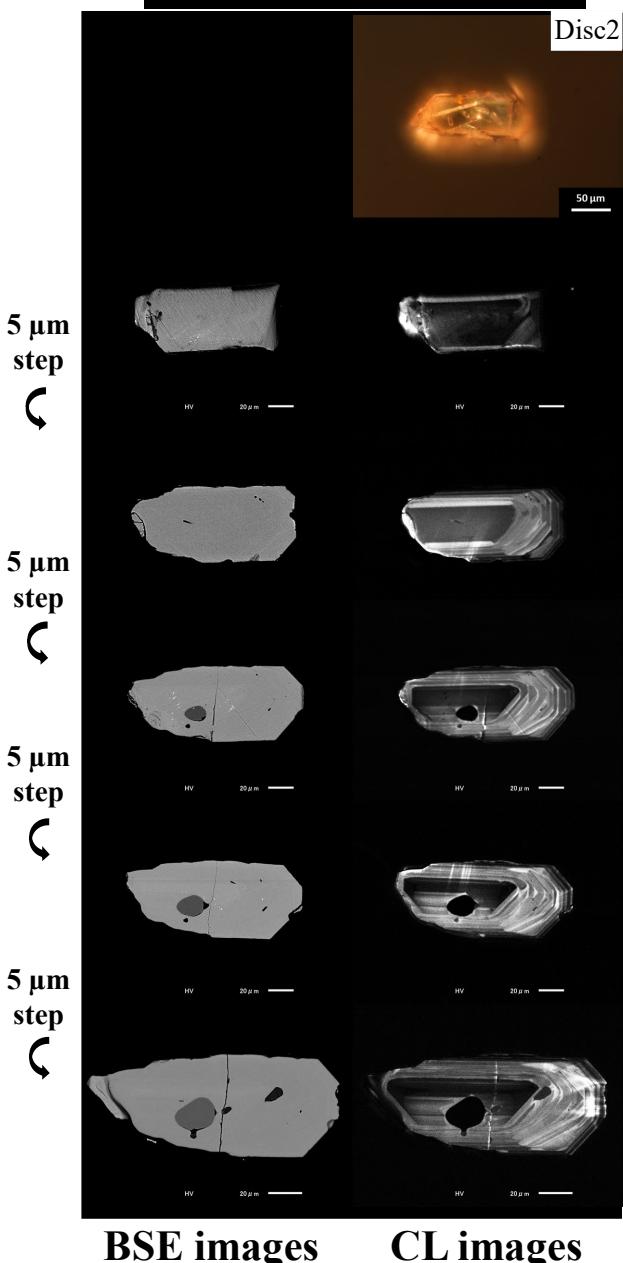
- Type {100}
- Major axis: 161 μm
- Minor axis: 71 μm
- Major axis/Minor axis: 2.3

**Observed internal texture**

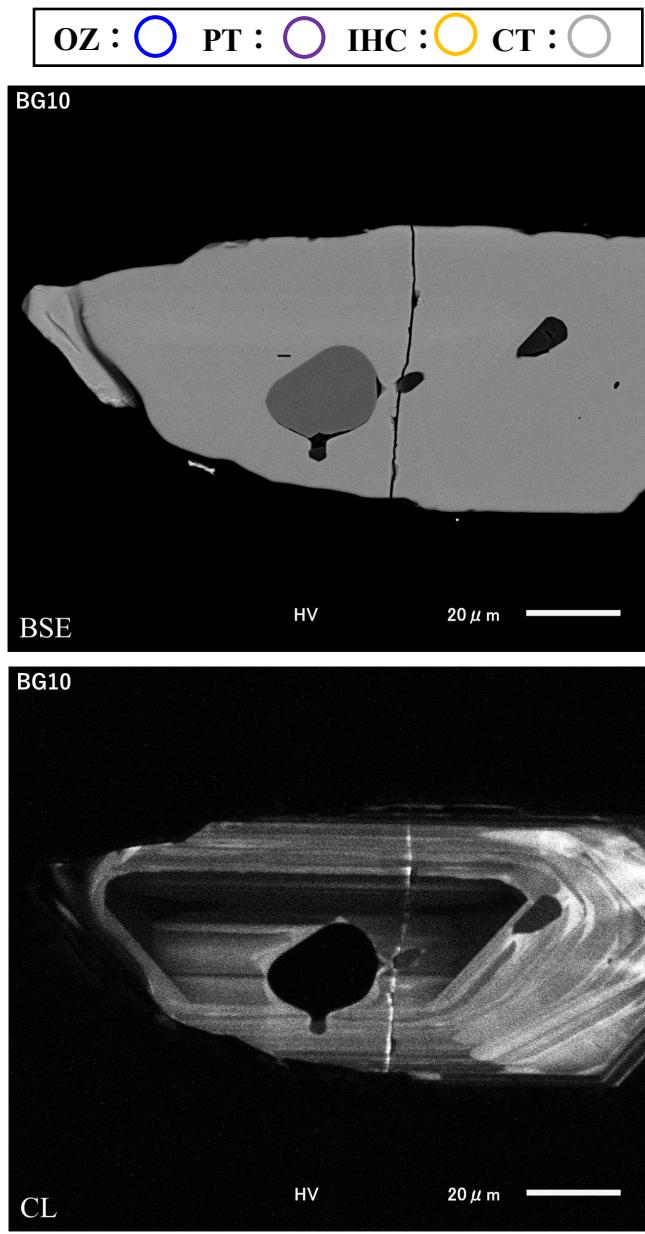
- OZ
- CT
- LDT

Fig. 8 Zircon data of grain No. BG9

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**



**<Legend>**

OZ: Oscillatory zoning  
PT: Porous texture  
CT: Chaotic texture  
LDT: Local disturbance texture  
IHC: Inherited core

**Morphological description**

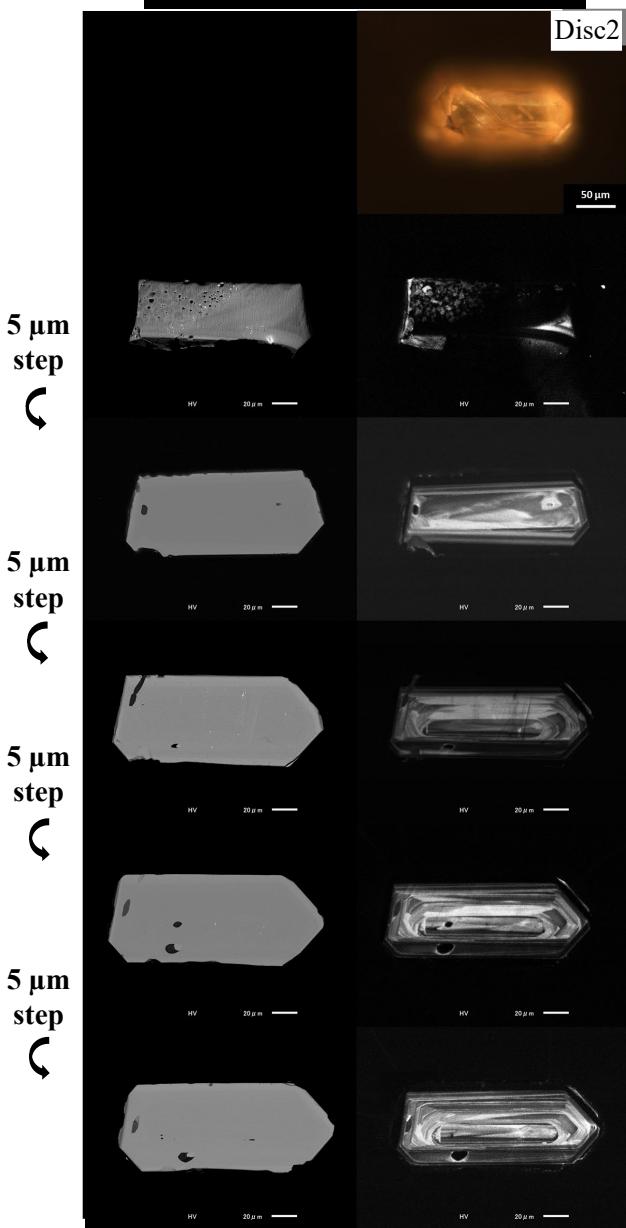
- Type {100}
- Major axis: 179 μm
- Minor axis: 68 μm
- Major axis/Minor axis: 2.6

**Observed internal texture**

- OZ

Fig. 9 Zircon data of grain No. BG10

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

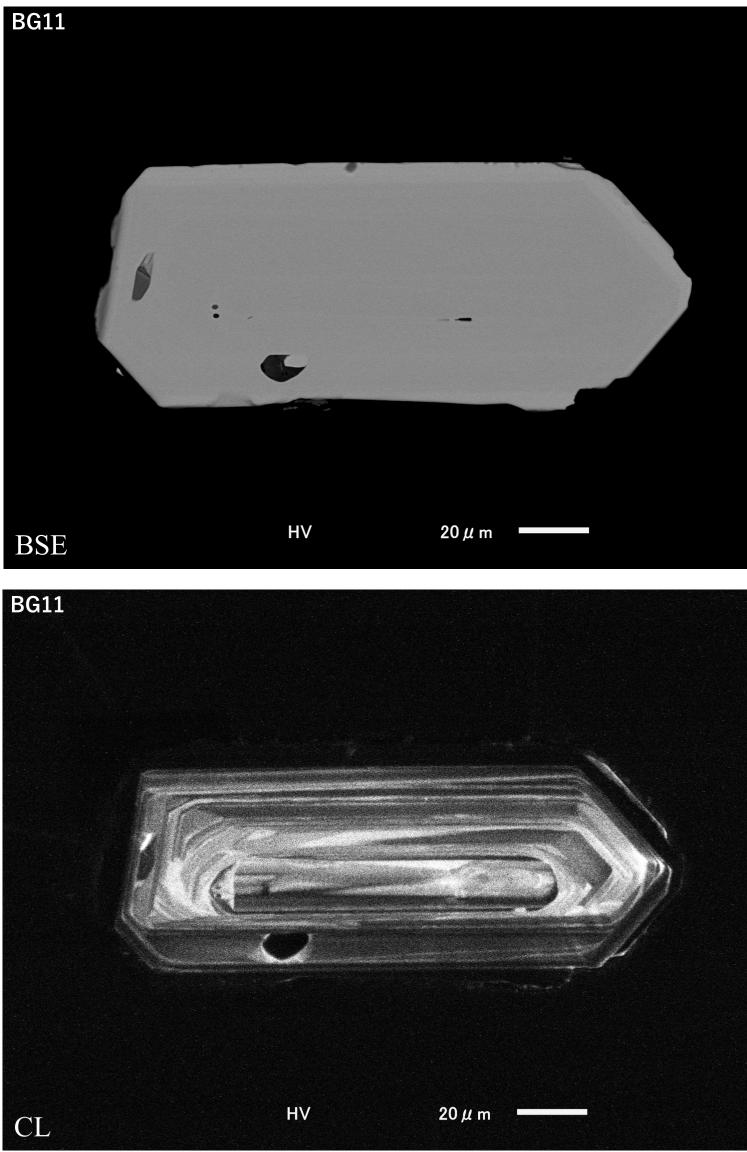
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

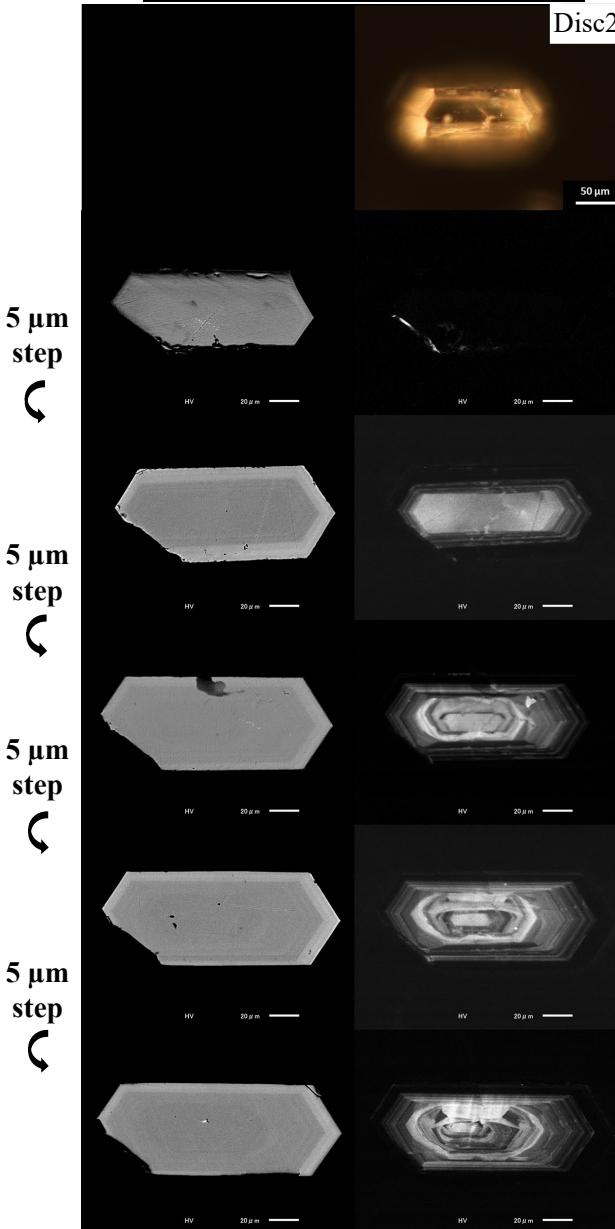
- Type {110}
- Major axis: 179 μm
- Minor axis: 68 μm
- Major axis/Minor axis: 2.6

**Observed internal texture**

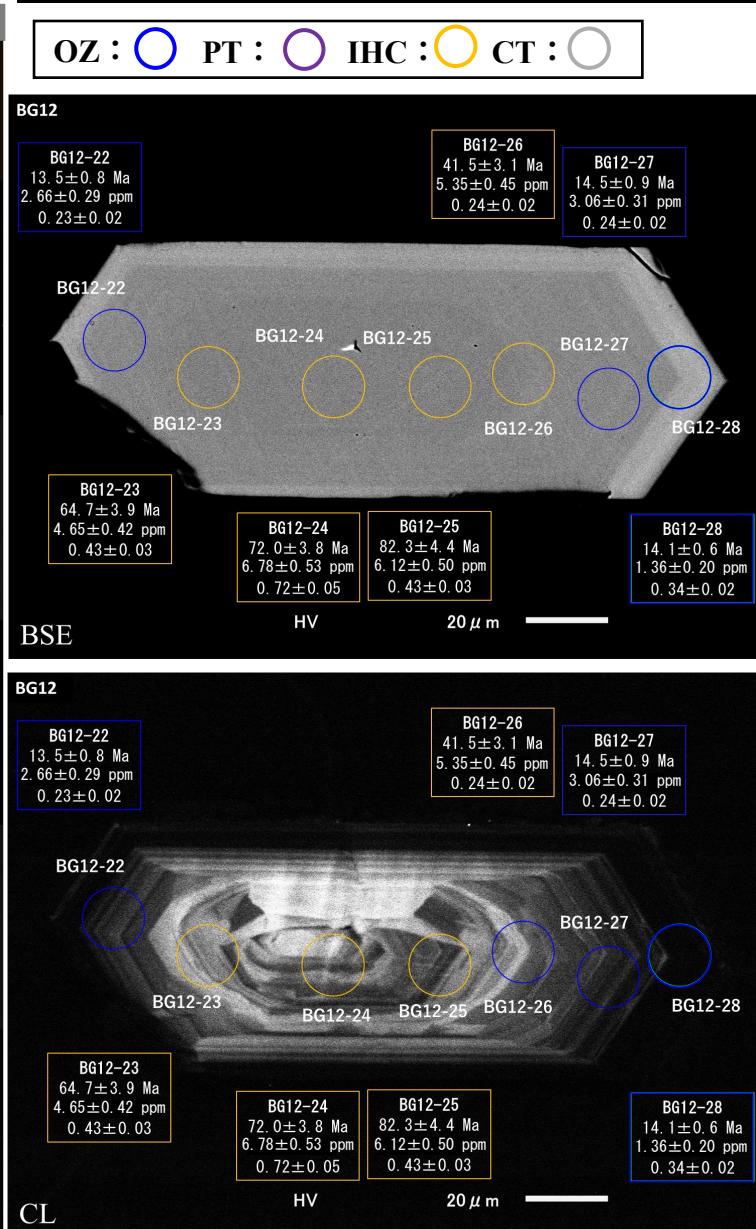
- OZ
- LDT

Fig. 10 Zircon data of grain No. BG11

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio



BSE images

CL images

### <Legend>

OZ: Oscillatory zoning

PT: Porous texture

CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

## Morphological description

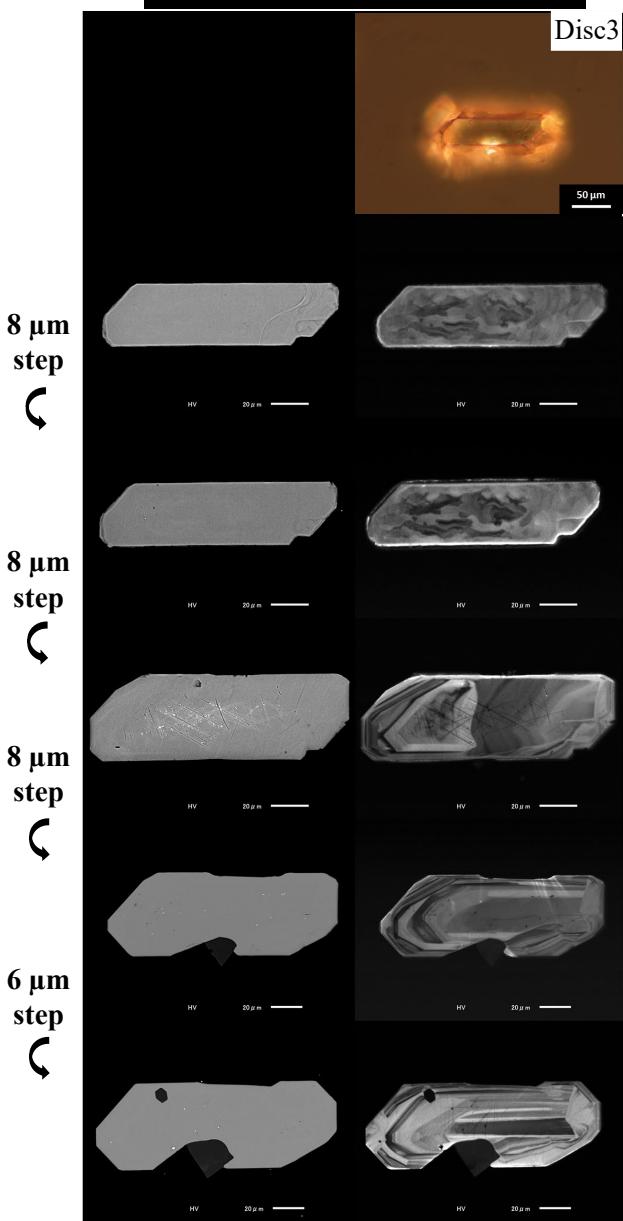
- Type {110}
- Major axis: 180 μm
- Minor axis: 66 μm
- Major axis/Minor axis: 2.8

## Observed internal texture

- OZ
- IHC

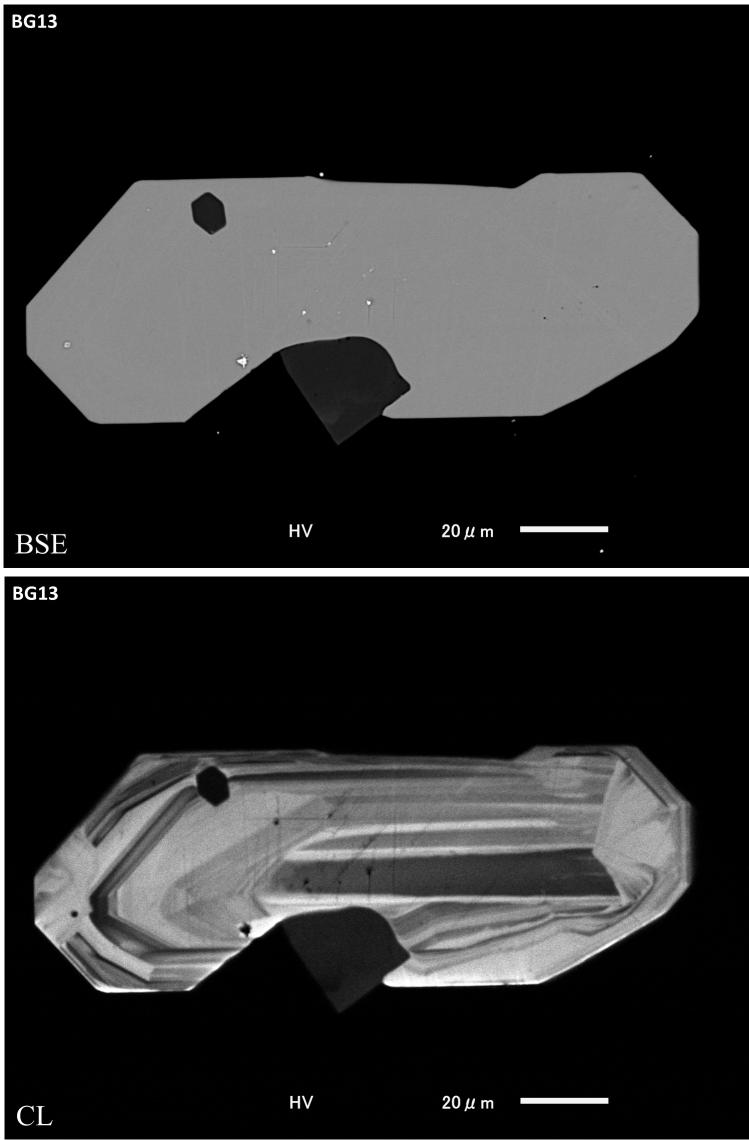
Fig. 11 Zircon data of grain No. BG12

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Morphological description**

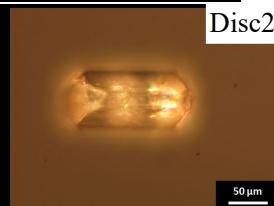
- Type {100}
- Major axis: 162  $\mu\text{m}$
- Minor axis: 56  $\mu\text{m}$
- Major axis/Minor axis: 2.9

**Observed internal texture**

- OZ
- CT

Fig. 12 Zircon data of grain No. BG13

**Morphological observation and CL observation for multi-layers**



5 μm step



5 μm step



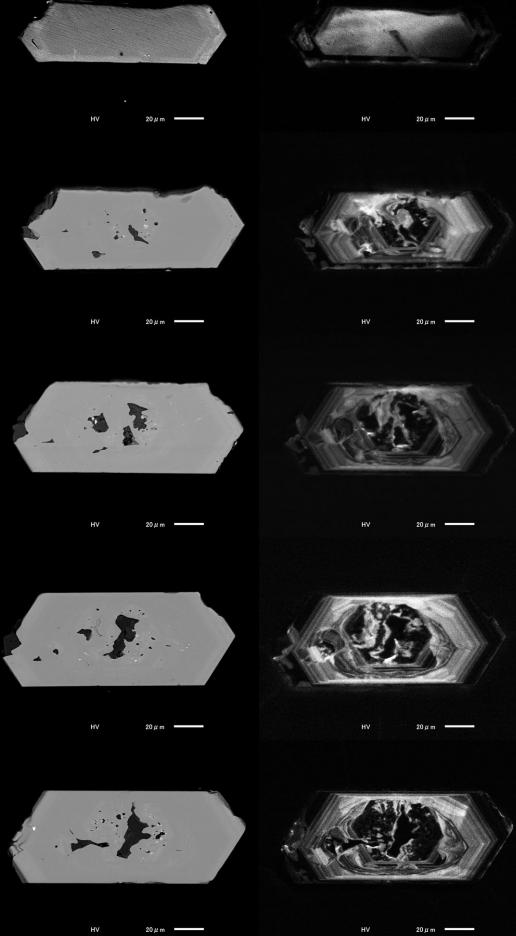
5 μm step



5 μm step



5 μm step



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

CT: Chaotic texture

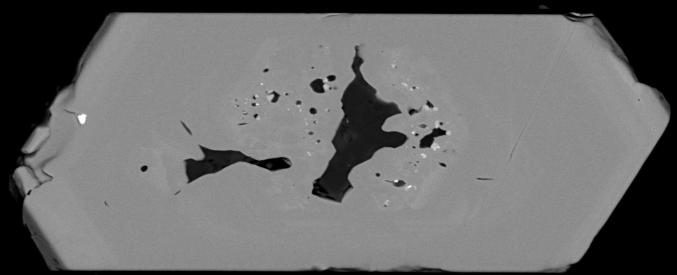
LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :

BG14

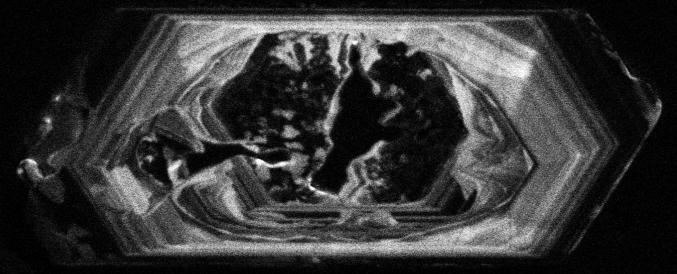


BSE

HV

20 μm

BG14



CL

HV

20 μm

**Morphological description**

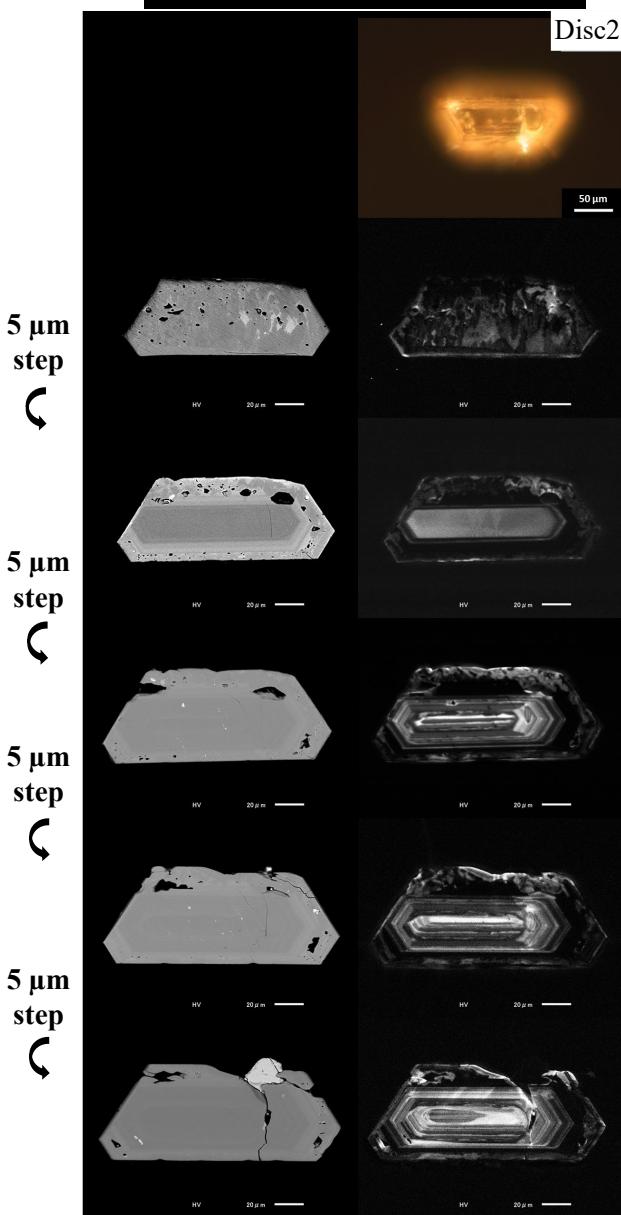
- Type {110}
- Major axis: 157 μm
- Minor axis: 69 μm
- Major axis/Minor axis: 2.3

**Observed internal texture**

- OZ
- PT
- CT

Fig. 13 Zircon data of grain No. BG14

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

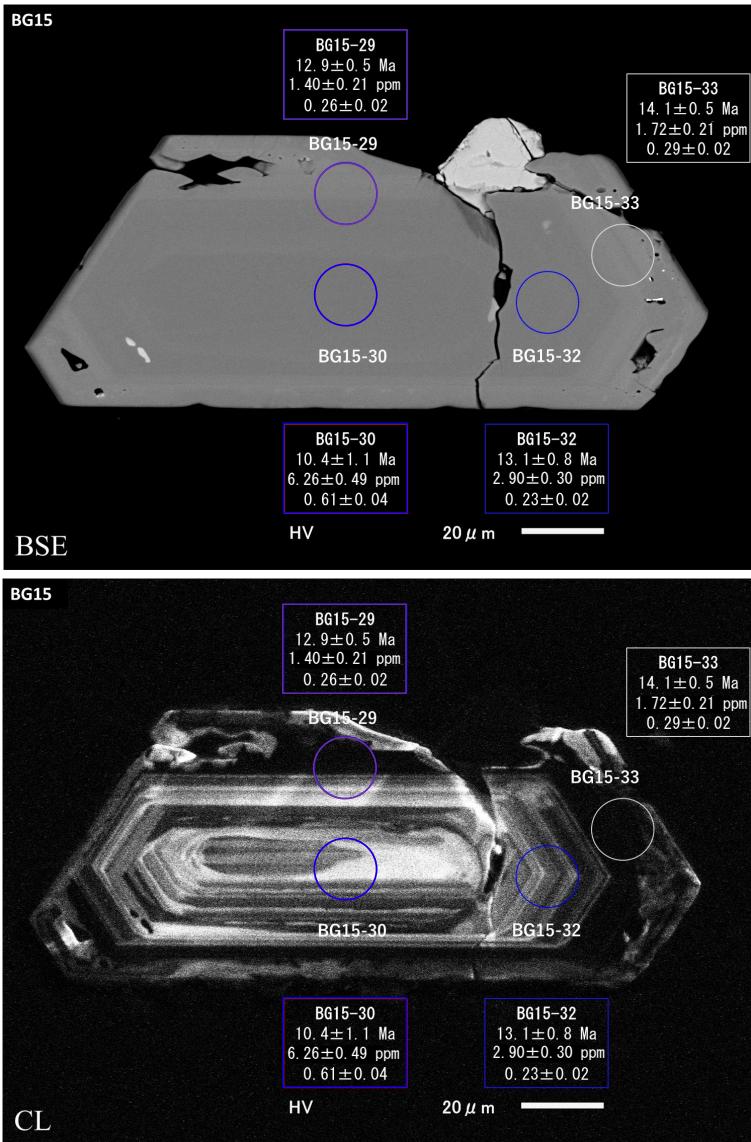
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

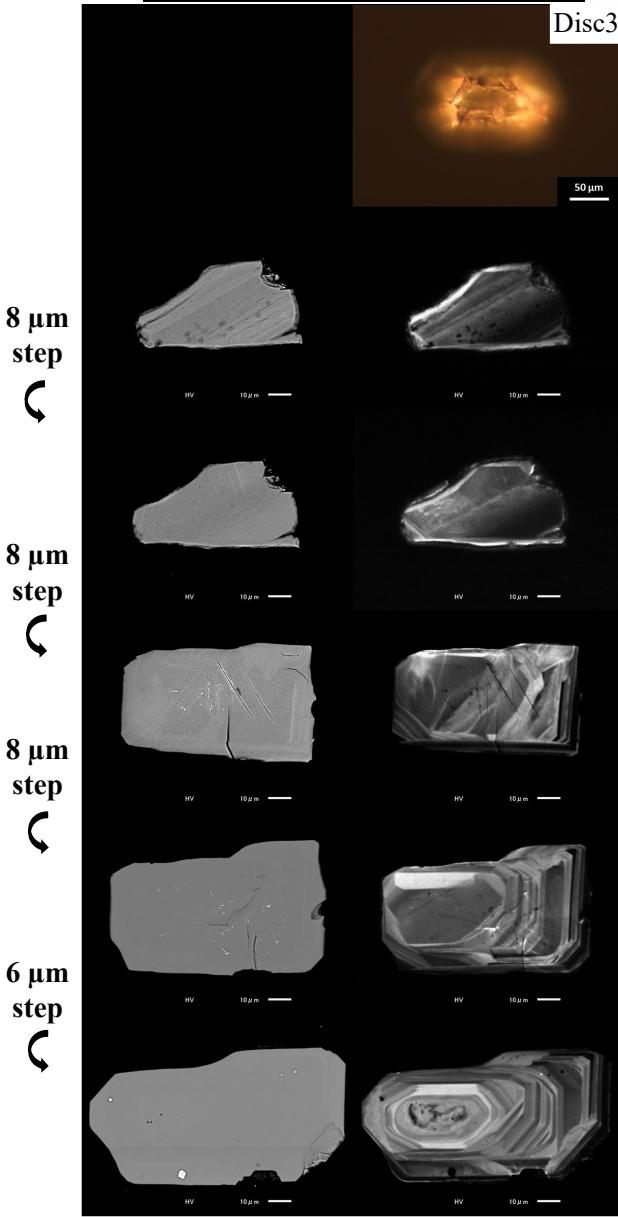
- Type {110}
- Major axis: 171  $\mu\text{m}$
- Minor axis: 70  $\mu\text{m}$
- Major axis/Minor axis: 2.4

**Observed internal texture**

- OZ
- PT
- CT

Fig. 14 Zircon data of grain No. BG15

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

<Legend>

OZ: Oscillatory zoning

PT: Porous texture

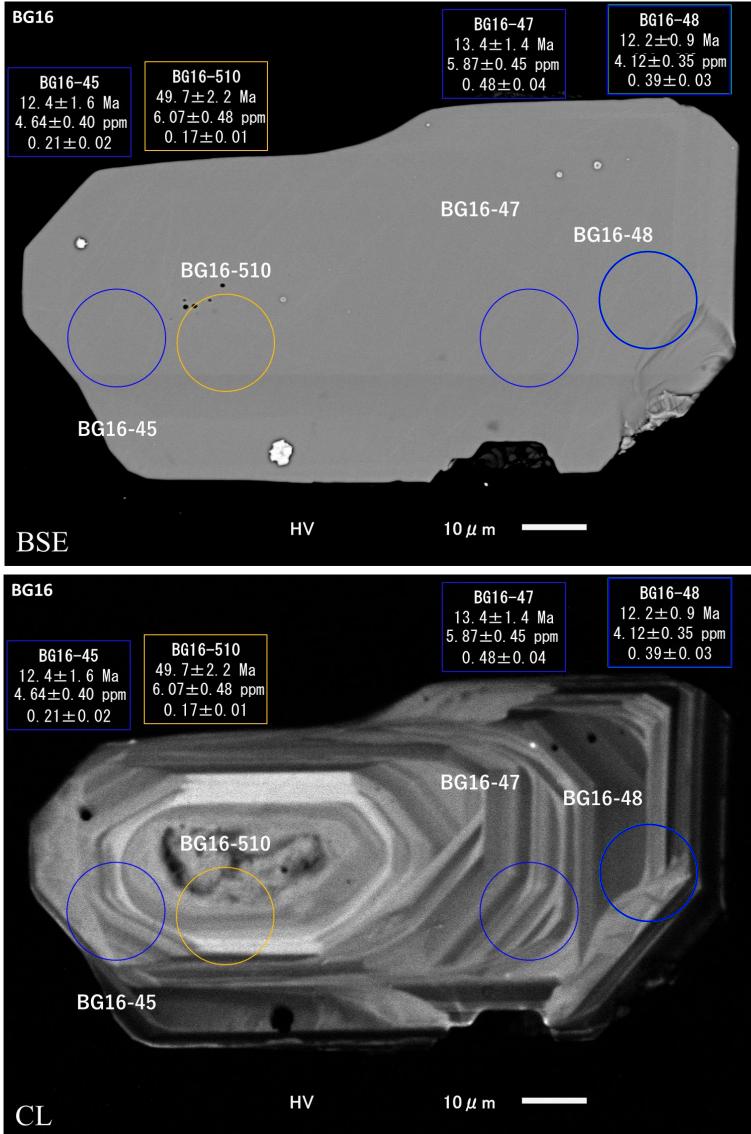
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

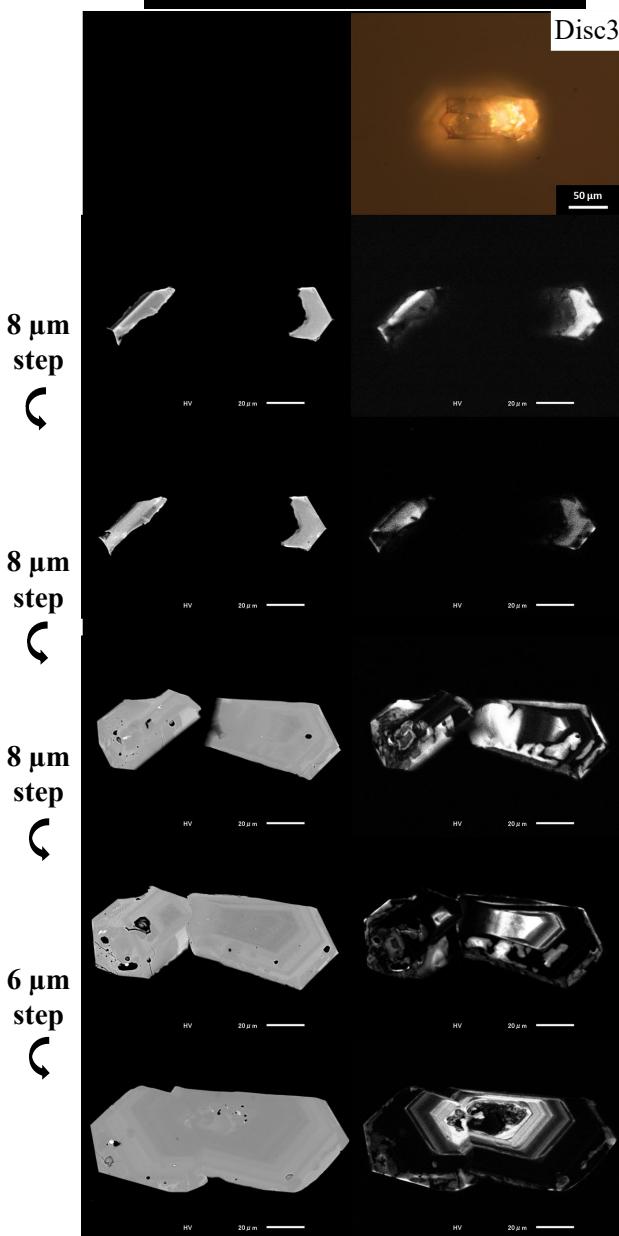
- Type {110}
- Major axis: 127  $\mu\text{m}$
- Minor axis: 53  $\mu\text{m}$
- Major axis/Minor axis: 2.4

**Observed internal texture**

- OZ
- IHC

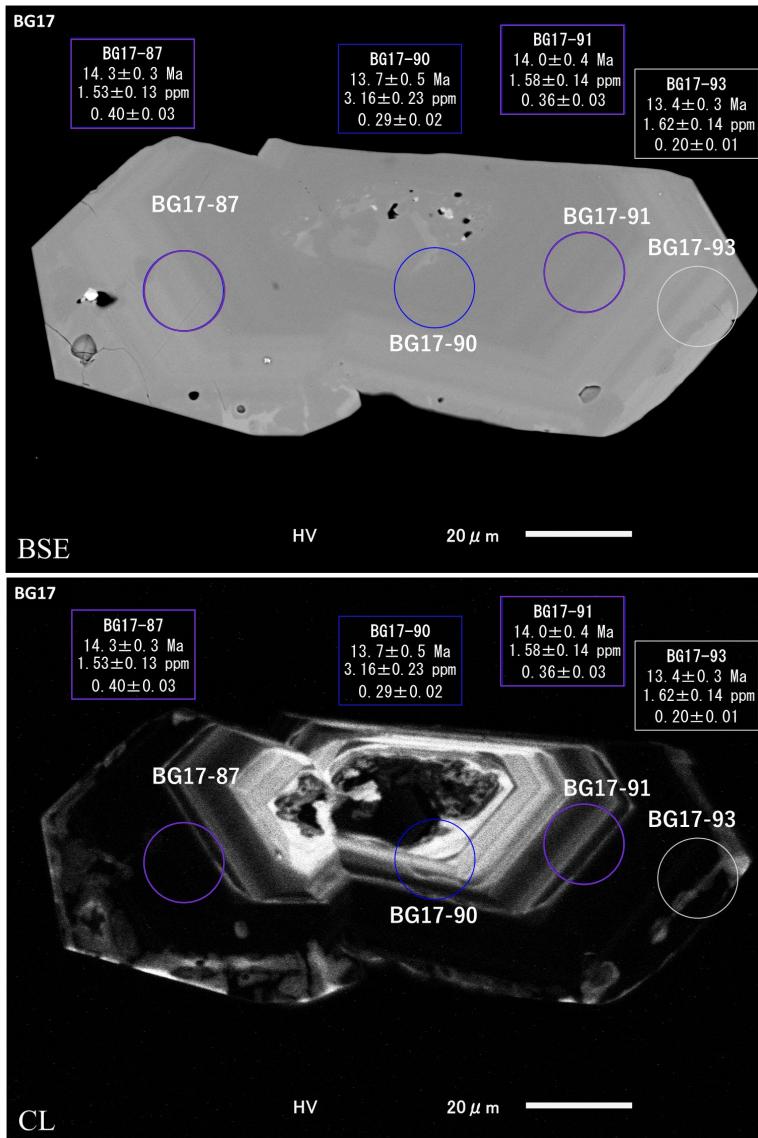
Fig. 15 Zircon data of grain No. BG16

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



BSE images

CL images

### <Legend>

OZ: Oscillatory zoning

PT: Porous texture

CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

## Morphological description

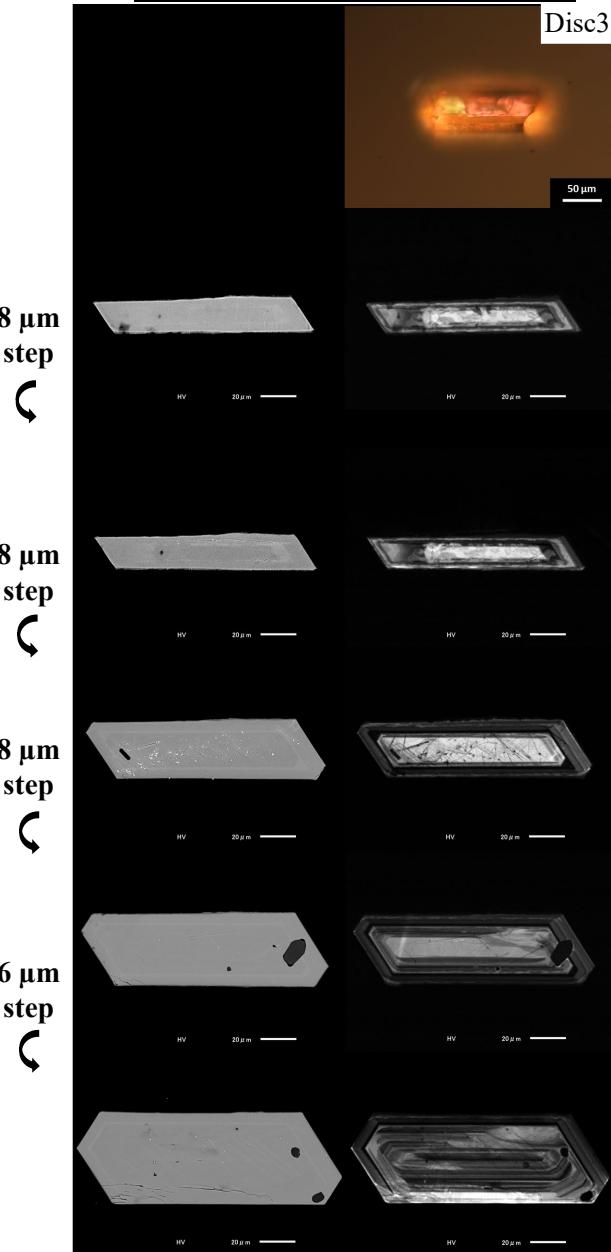
- Type {110}
- Major axis: 141 μm
- Minor axis: 53 μm
- Major axis/Minor axis: 2.6

## Observed internal texture

- OZ
- PT
- CT

Fig. 16 Zircon data of grain No. BG17

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :

**BG18**

BG18-50  
12. 6±1. 1 Ma  
6. 76±0. 53 ppm  
0. 63±0. 05

BG18-51  
12. 9±1. 3 Ma  
5. 74±0. 47 ppm  
0. 74±0. 06

BG18-52  
11. 5±1. 2 Ma  
6. 00±0. 48 ppm  
0. 60±0. 05

**BSE**

HV

20 μm

**BG18**

BG18-50  
12. 6±1. 1 Ma  
6. 76±0. 53 ppm  
0. 63±0. 05

BG18-51  
12. 9±1. 3 Ma  
5. 74±0. 47 ppm  
0. 74±0. 06

BG18-52  
11. 5±1. 2 Ma  
6. 00±0. 48 ppm  
0. 60±0. 05

**CL**

HV

20 μm

**Morphological description**

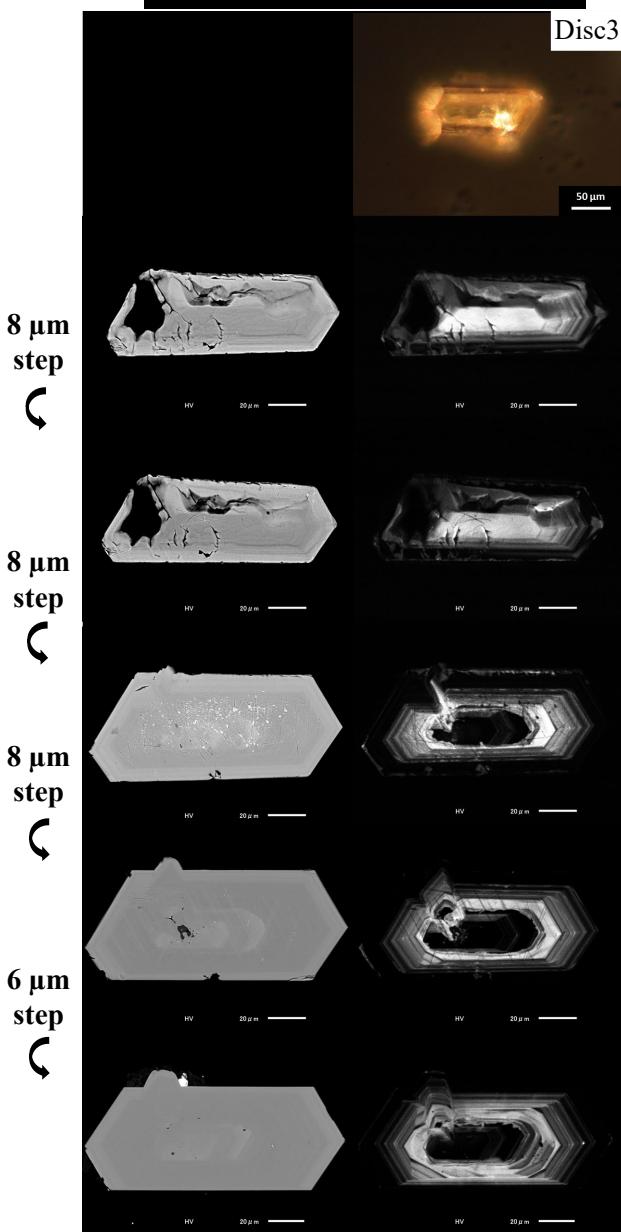
- Type {100}
- Major axis: 154 μm
- Minor axis: 52 μm
- Major axis/Minor axis: 2.9

**Observed internal texture**

- OZ
- CH

Fig. 17 Zircon data of grain No. BG18

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

<Legend>

OZ: Oscillatory zoning

PT: Porous texture

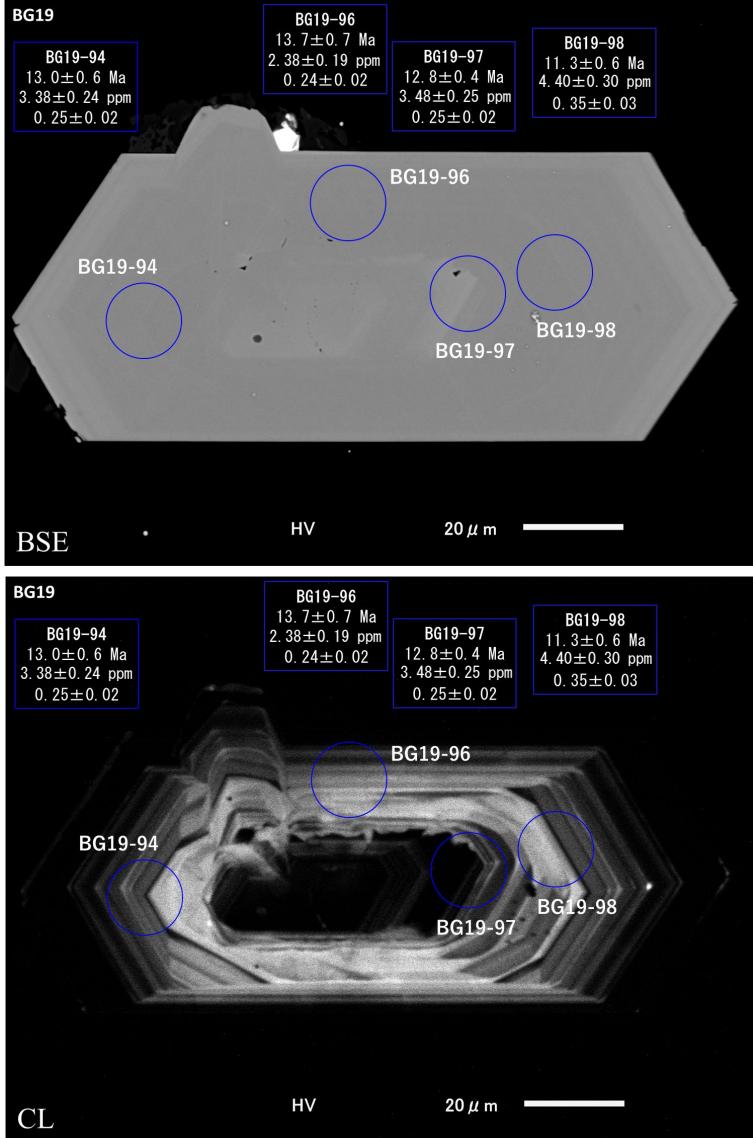
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

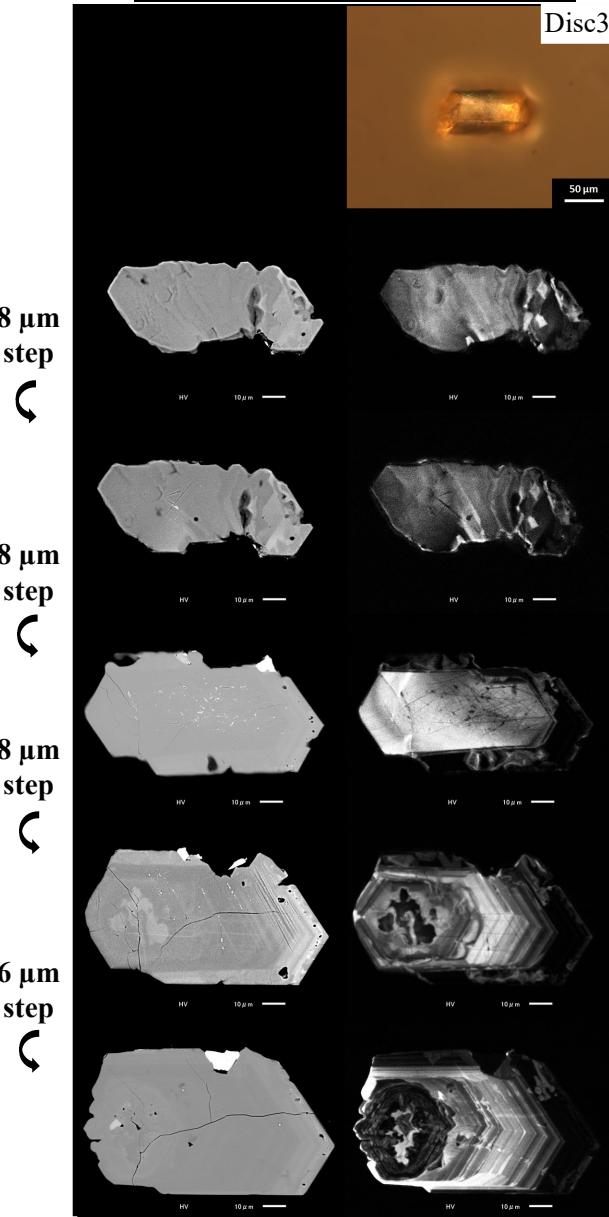
- Type {110}
- Major axis: 153 μm
- Minor axis: 59 μm
- Major axis/Minor axis: 2.6

**Observed internal texture**

- OZ

Fig. 18 Zircon data of grain No. BG19

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

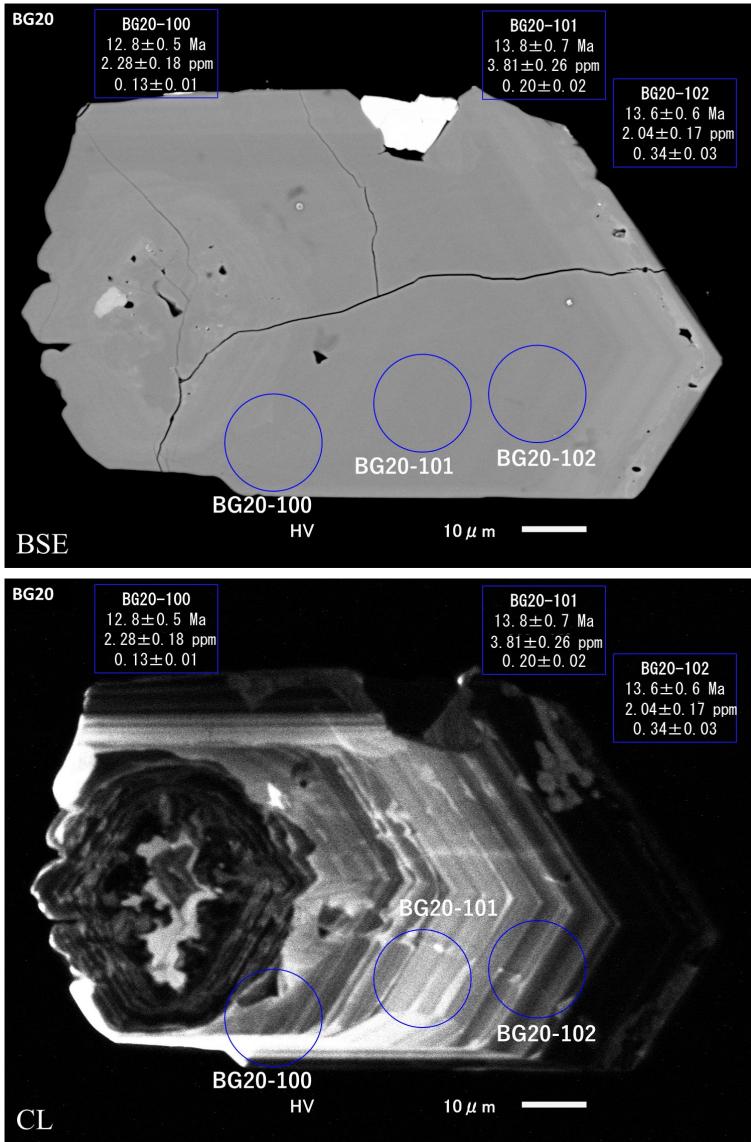
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

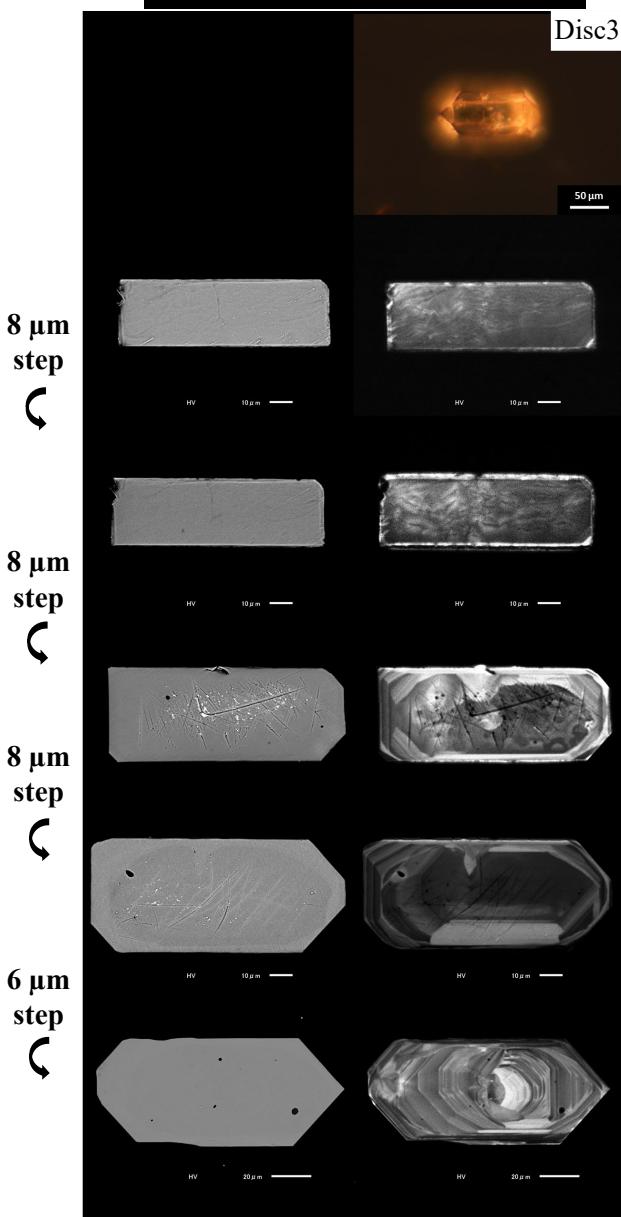
- Type {100}
- Major axis: 122  $\mu\text{m}$
- Minor axis: 54  $\mu\text{m}$
- Major axis/Minor axis: 2.2

**Observed internal texture**

- OZ
- PT
- CT

Fig. 19 Zircon data of grain No. BG20

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

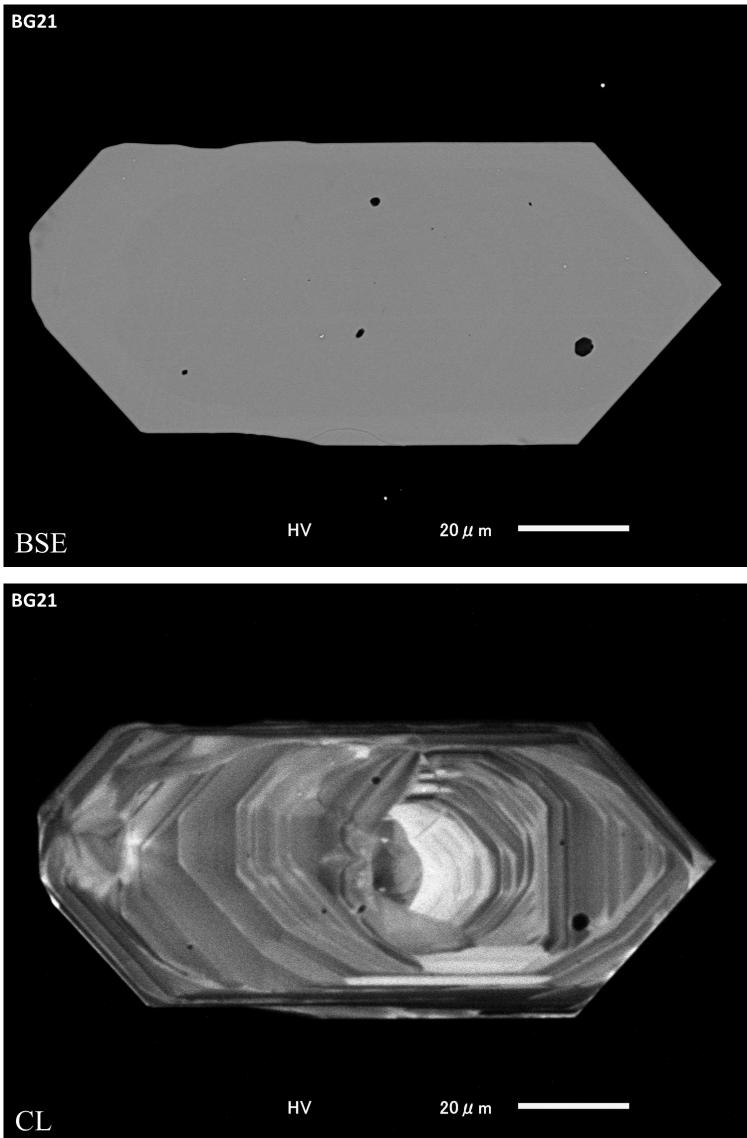
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

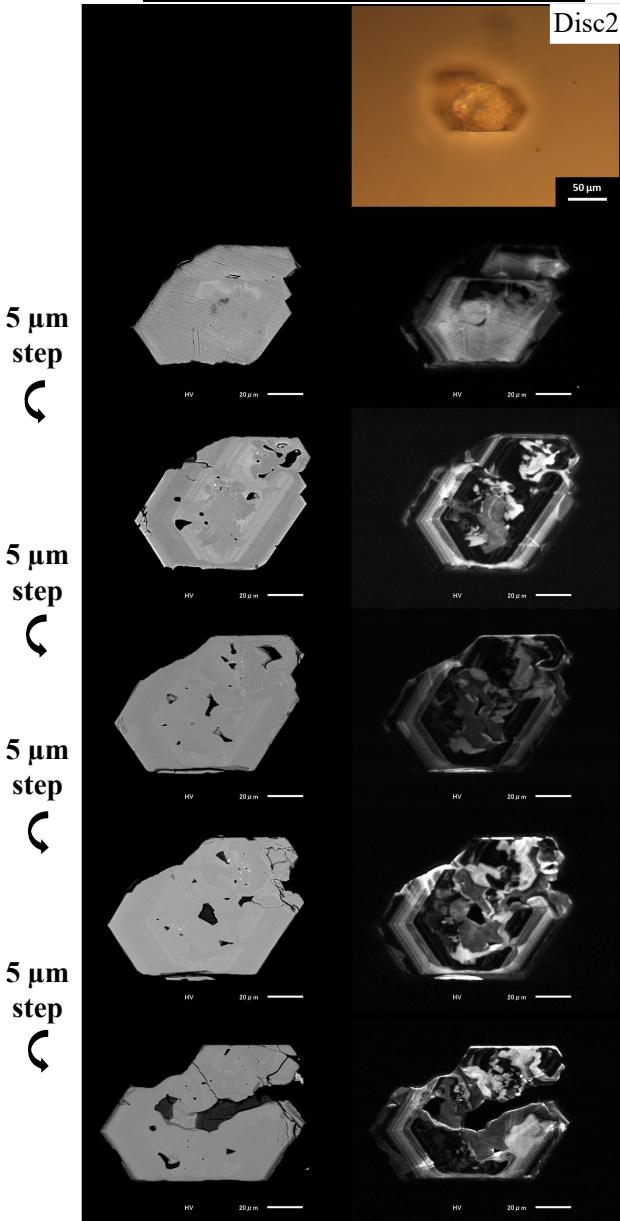
- Type {100}
- Major axis: 130 μm
- Minor axis: 57 μm
- Major axis/Minor axis: 2.3

**Observed internal texture**

- OZ
- CT

Fig. 20 Zircon data of grain No. BG21

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

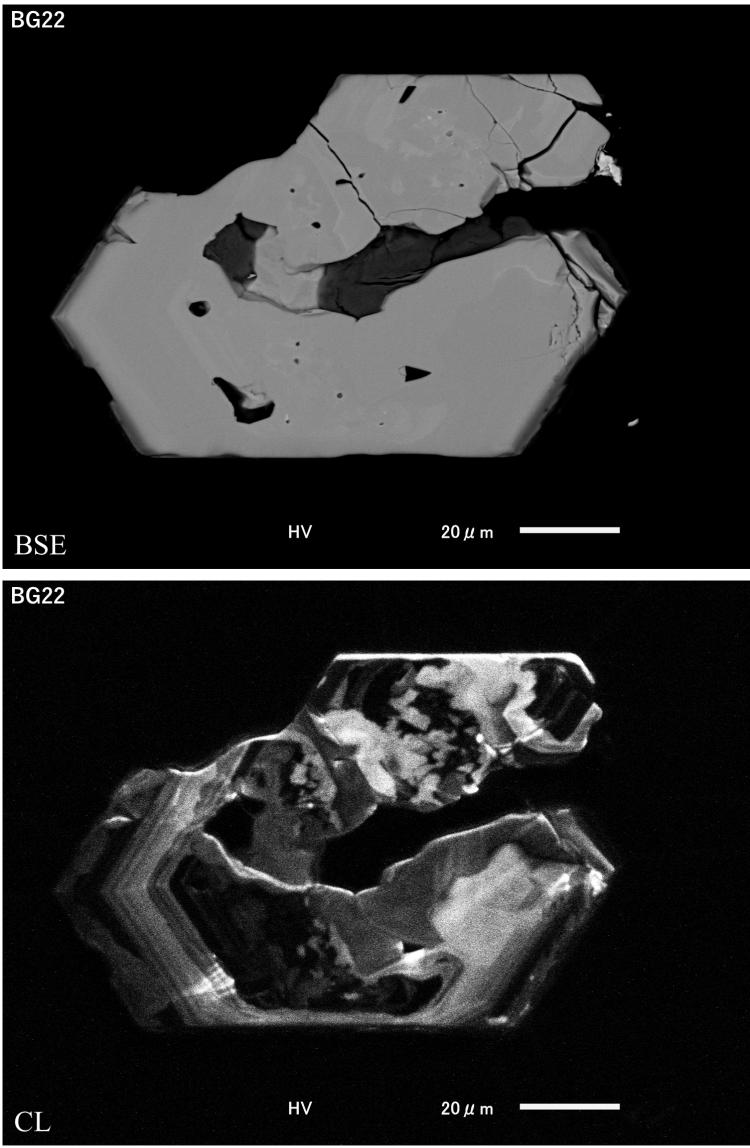
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

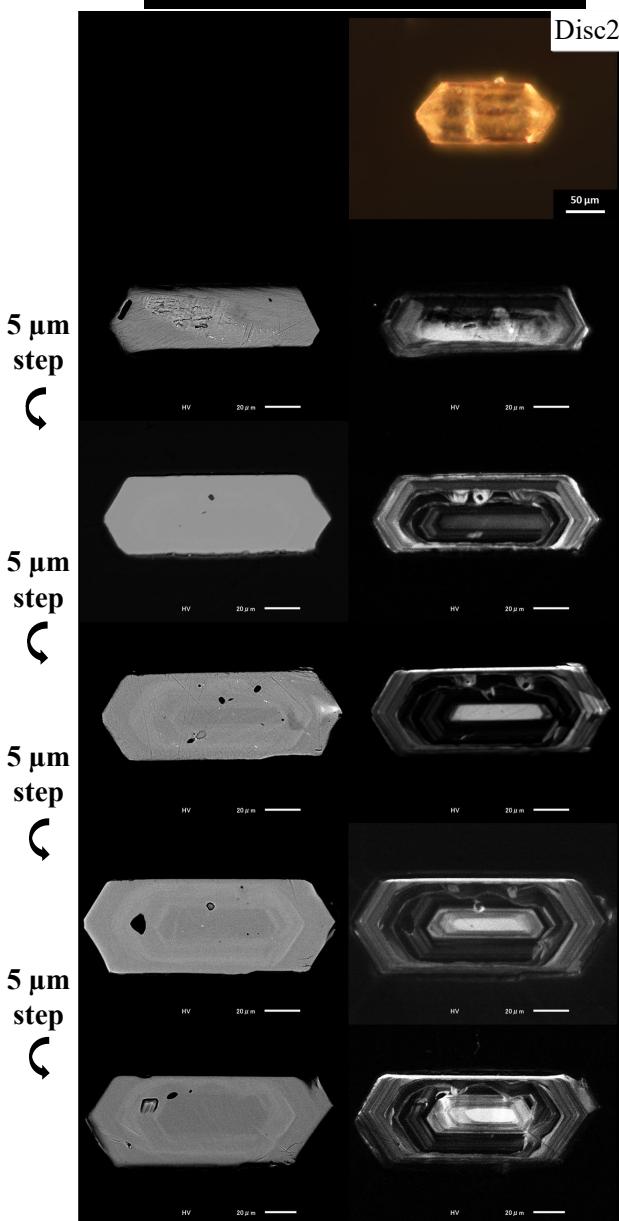
- Type {110}
- Major axis: 116 μm
- Minor axis: 64 μm
- Major axis/Minor axis: 1.8

**Observed internal texture**

- OZ
- PT
- CT

Fig. 21 Zircon data of grain No. BG22

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

<Legend>

OZ: Oscillatory zoning

PT: Porous texture

CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

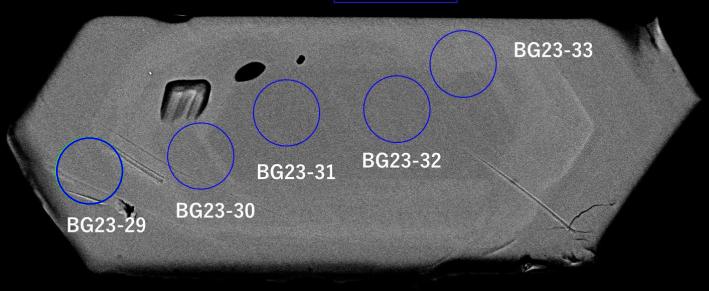
OZ : PT : IHC : CT :

BG23

BG23-31  
11.6±1.5 Ma  
7.47±0.56 ppm  
0.45±0.04

BG23-32  
12.1±1.0 Ma  
3.59±0.34 ppm  
0.32±0.02

BG23-33  
13.4±0.7 Ma  
2.95±0.30 ppm  
0.12±0.01



BG23-29  
13.8±0.8 Ma  
2.83±0.28 ppm  
0.21±0.01

BG23-30  
13.9±0.8 Ma  
3.42±0.33 ppm  
0.52±0.03

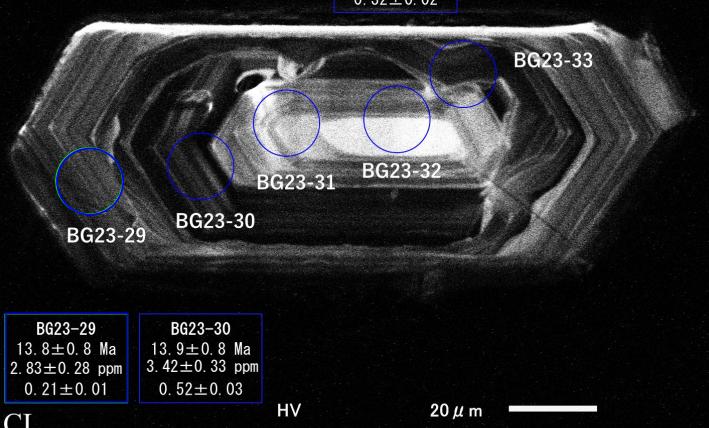
BSE

BG23

BG23-31  
11.6±1.5 Ma  
7.47±0.56 ppm  
0.45±0.04

BG23-32  
12.1±1.0 Ma  
3.59±0.34 ppm  
0.32±0.02

BG23-33  
13.4±0.7 Ma  
2.95±0.30 ppm  
0.12±0.01



BG23-29  
13.8±0.8 Ma  
2.83±0.28 ppm  
0.21±0.01

BG23-30  
13.9±0.8 Ma  
3.42±0.33 ppm  
0.52±0.03

CL

**Morphological description**

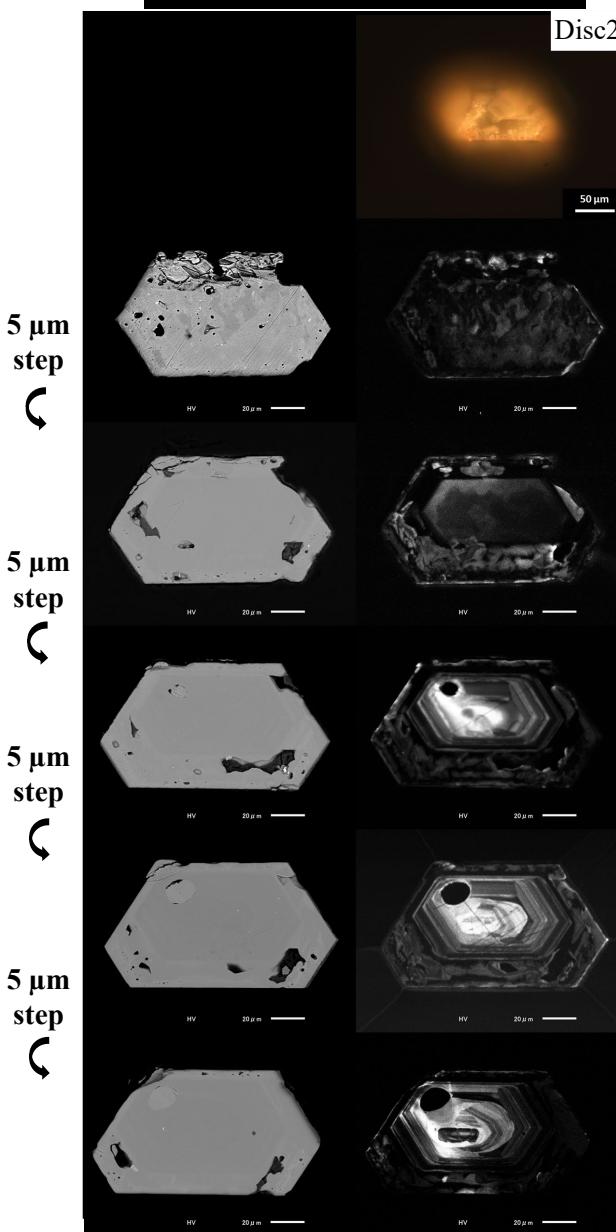
- Type {100}
- Major axis: 180  $\mu\text{m}$
- Minor axis: 78  $\mu\text{m}$
- Major axis/Minor axis: 2.3

**Observed internal texture**

- OZ
- CT

Fig. 22 Zircon data of grain No. BG23

## Morphological observation and CL observation for multi-layers



BSE images

CL images

<Legend>

OZ: Oscillatory zoning

PT: Porous texture

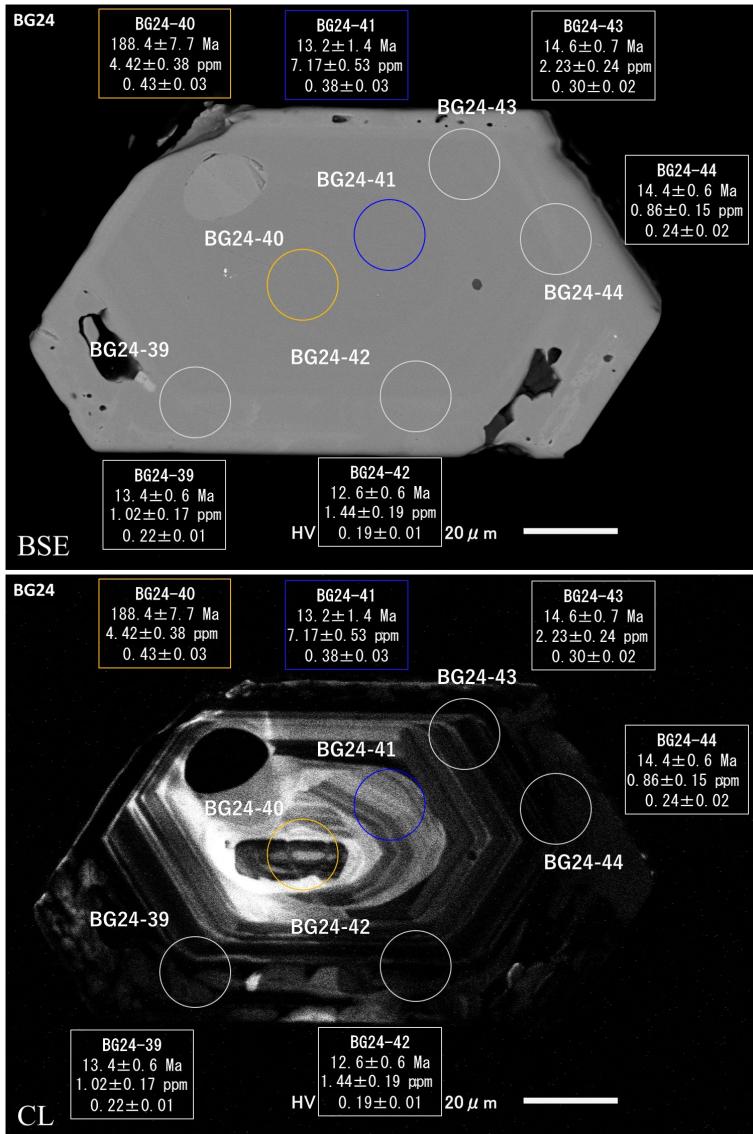
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

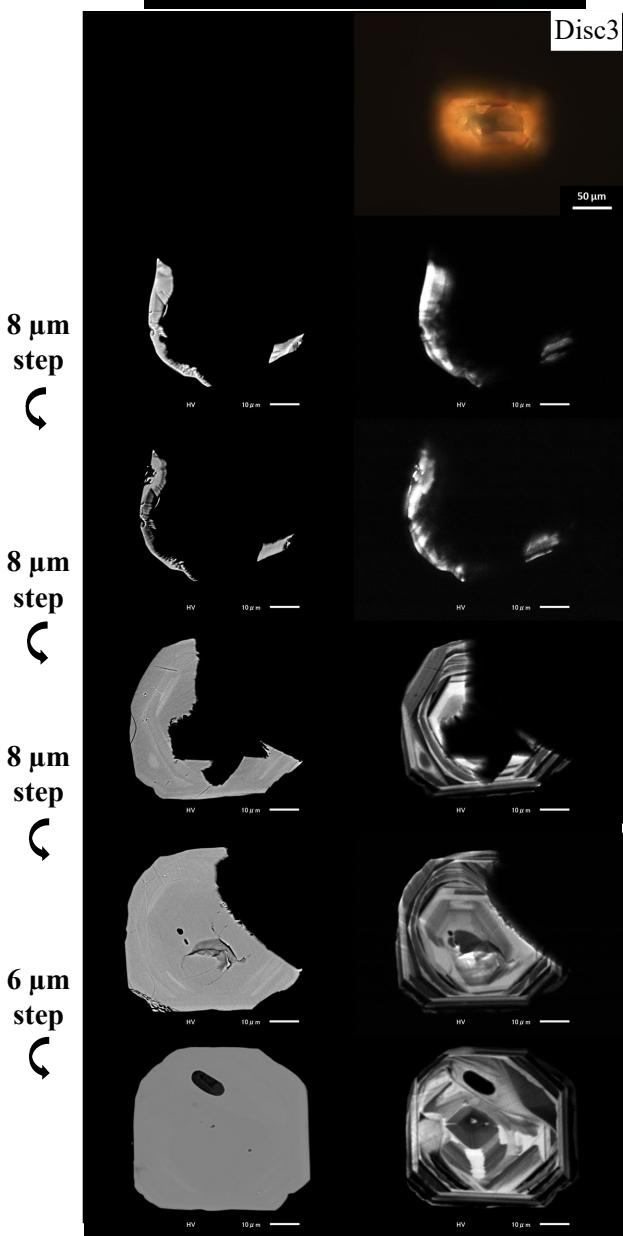
- Type {110}
- Major axis: 139 μm
- Minor axis: 63 μm
- Major axis/Minor axis: 2.2

## Observed internal texture

- OZ
- PT
- CT
- IHC

Fig. 23 Zircon data of grain No. BG24

**Morphological observation and CL observation for multi-layers**



BSE images

CL images

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

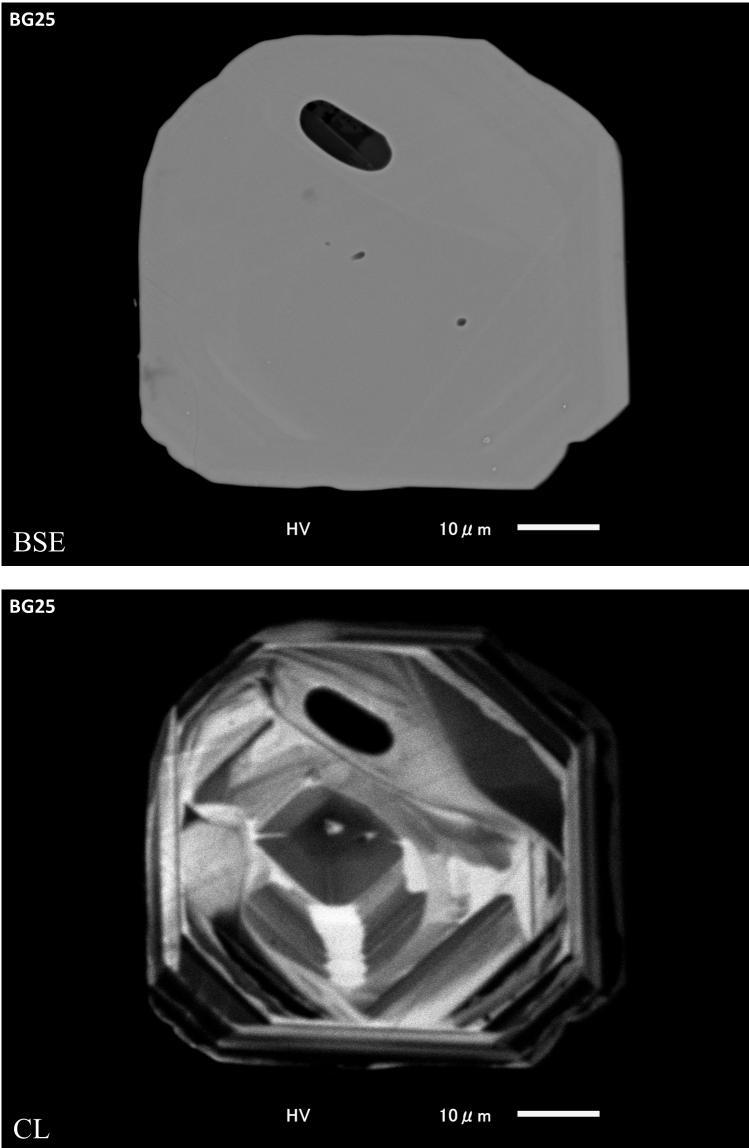
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

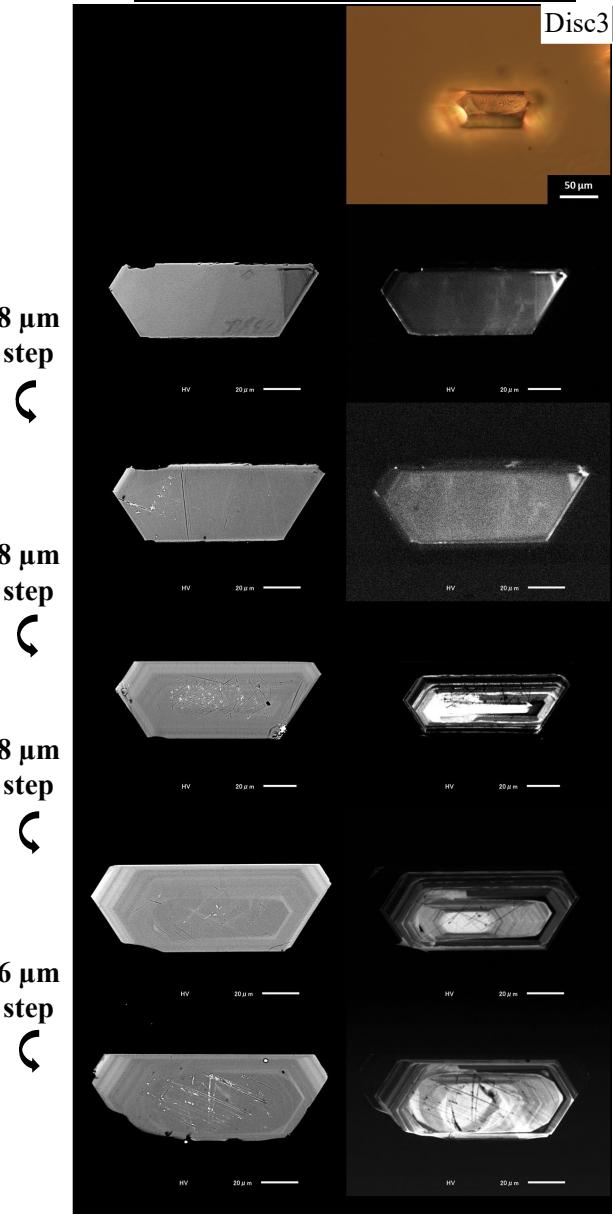
- Type {100}
- Major axis: 115 μm
- Minor axis: 60 μm
- Major axis/Minor axis: 1.9

**Observed internal texture**

- OZ
- PT

Fig. 24 Zircon data of grain No. BG25

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

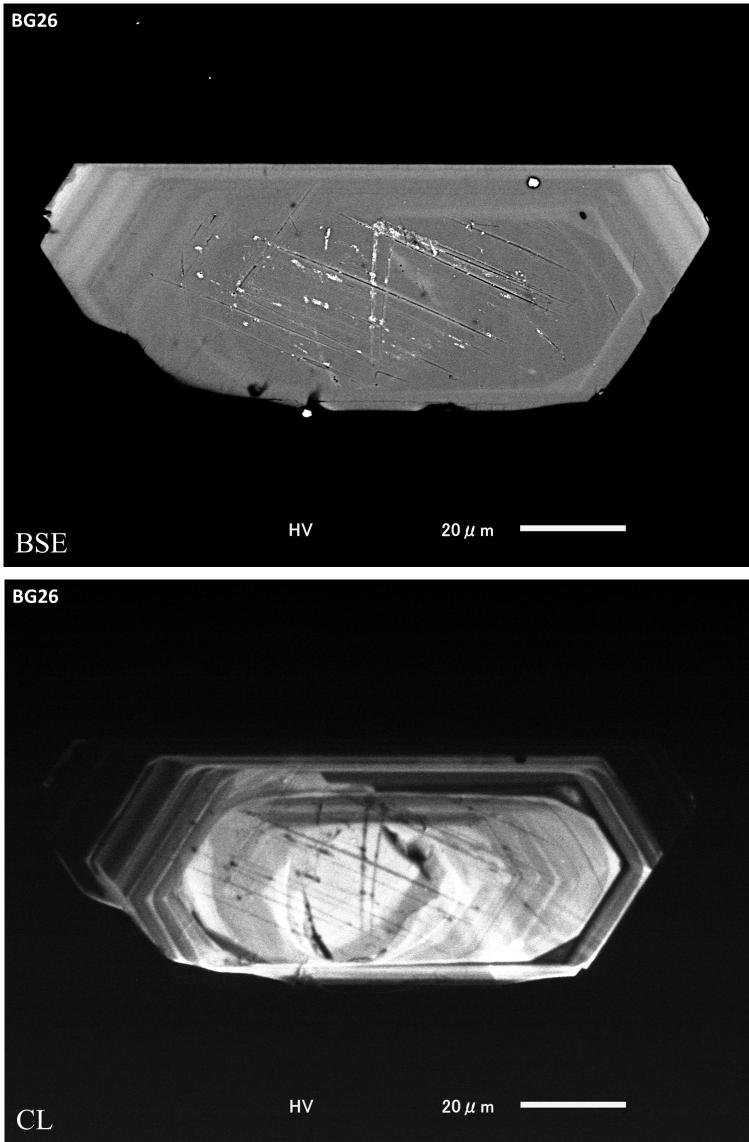
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

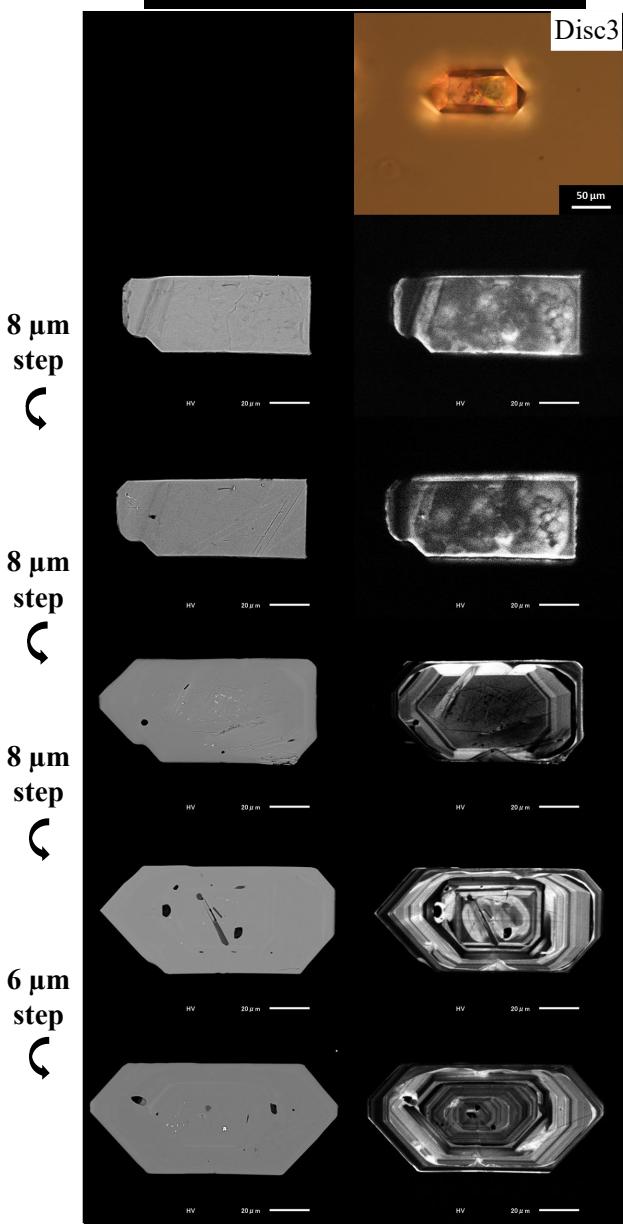
- Type {110}
- Major axis: 133 μm
- Minor axis: 53 μm
- Major axis/Minor axis: 2.5

**Observed internal texture**

- OZ
- PT

Fig. 25 Zircon data of grain No. BG26

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

<Legend>

OZ: Oscillatory zoning

PT: Porous texture

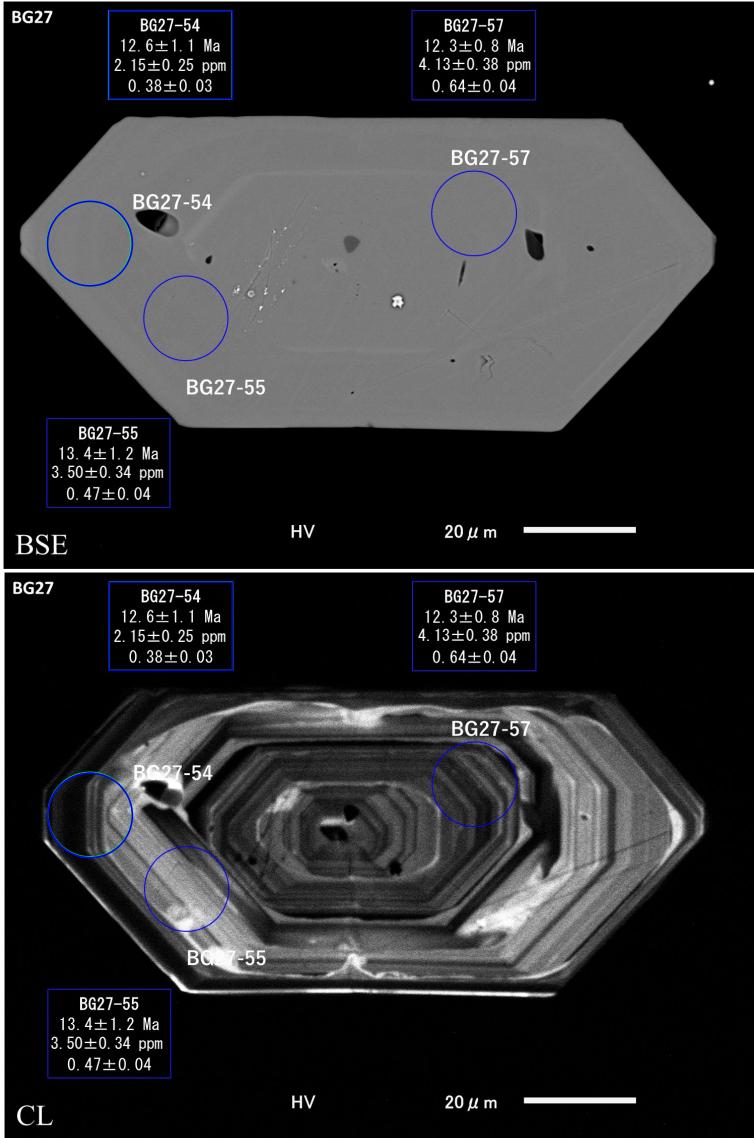
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

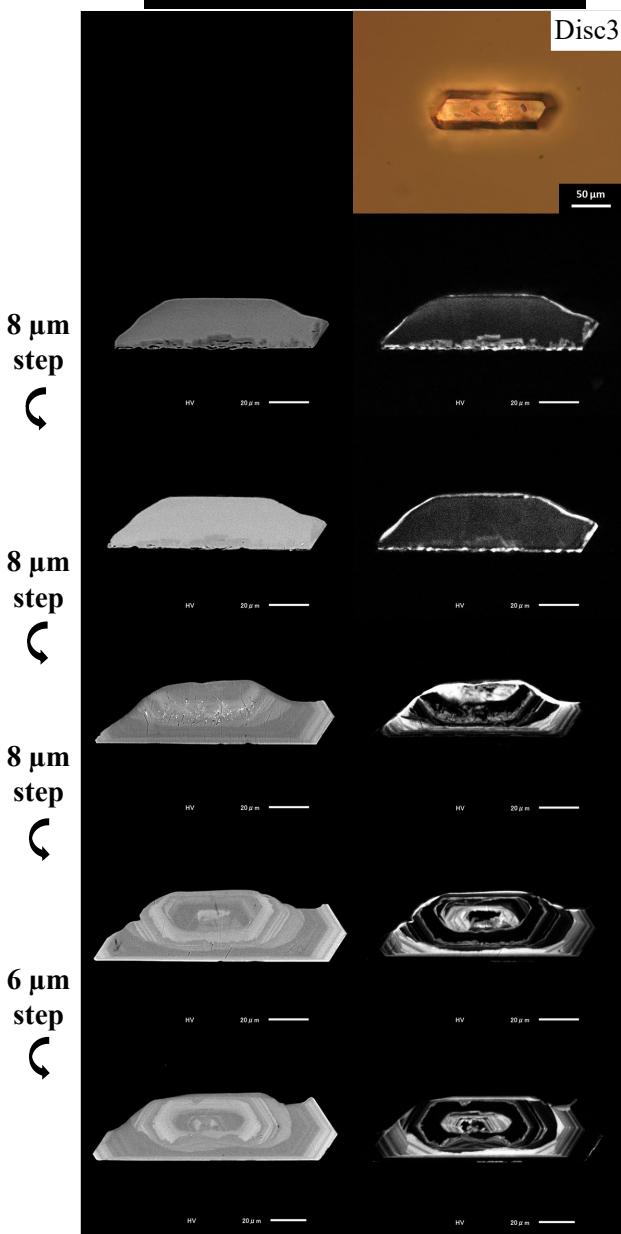
- Type {100}
- Major axis: 128 μm
- Minor axis: 58 μm
- Major axis/Minor axis: 2.2

**Observed internal texture**

- OZ
- PT

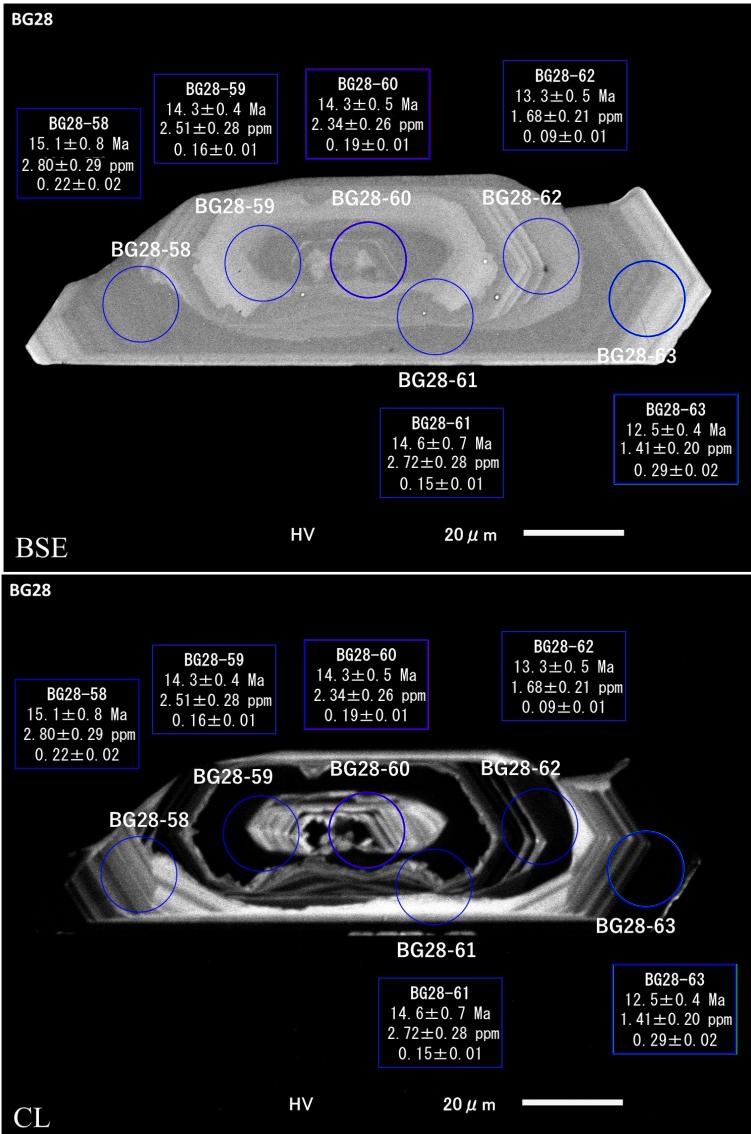
Fig. 26 Zircon data of grain No. BG27

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

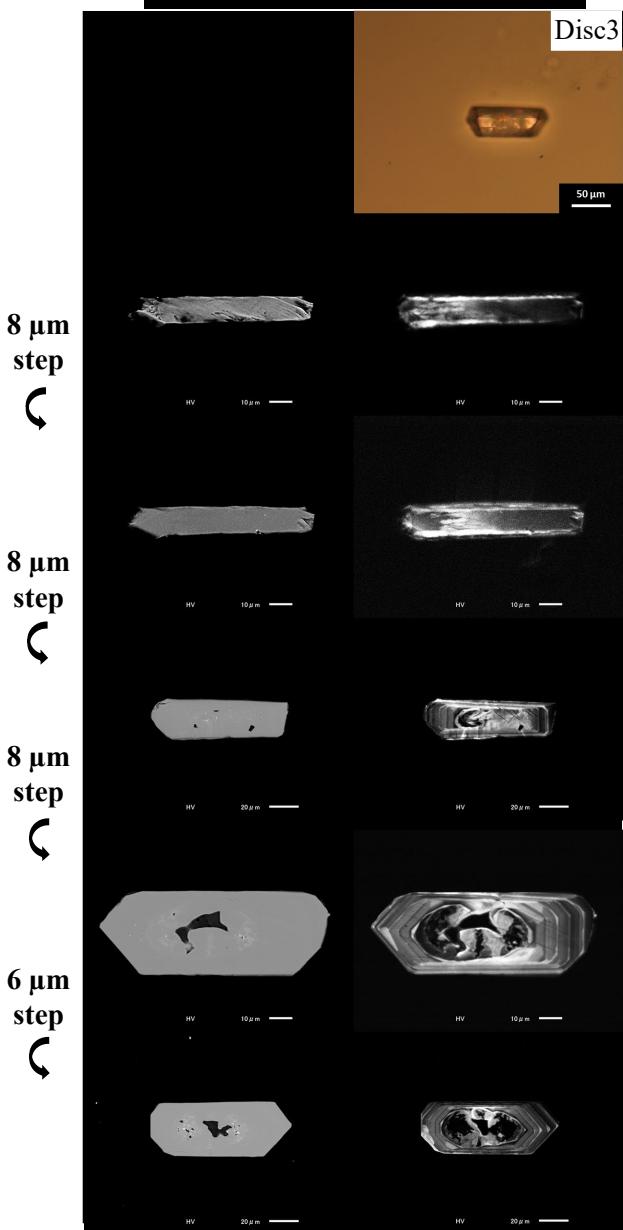
- Type {110}
- Major axis: 165  $\mu\text{m}$
- Minor axis: 52  $\mu\text{m}$
- Major axis/Minor axis: 3.2

## Observed internal texture

- OZ
- PT

Fig. 27 Zircon data of grain No. BG28

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

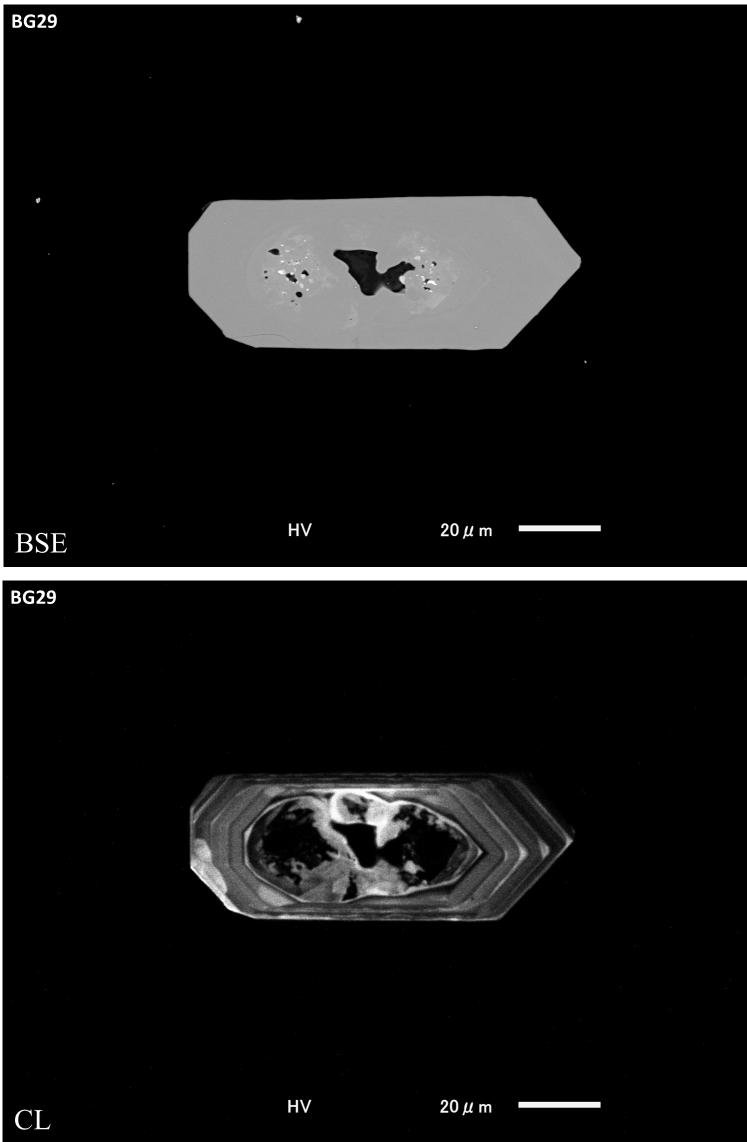
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

- Type {100}
- Major axis: 105 μm
- Minor axis: 39 μm
- Major axis/Minor axis: 2.7

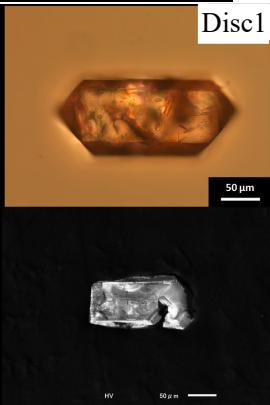
**Observed internal texture**

- OZ
- PT

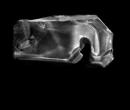
Fig. 28 Zircon data of grain No. BG29

## Morphological observation and CL observation for multi-layers

5  $\mu\text{m}$   
step



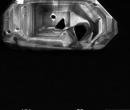
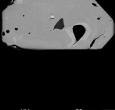
8  $\mu\text{m}$   
step



8  $\mu\text{m}$   
step



10  $\mu\text{m}$   
step



5  $\mu\text{m}$   
step



BSE images

CL images

### <Legend>

OZ: Oscillatory zoning

PT: Porous texture

CT: Chaotic texture

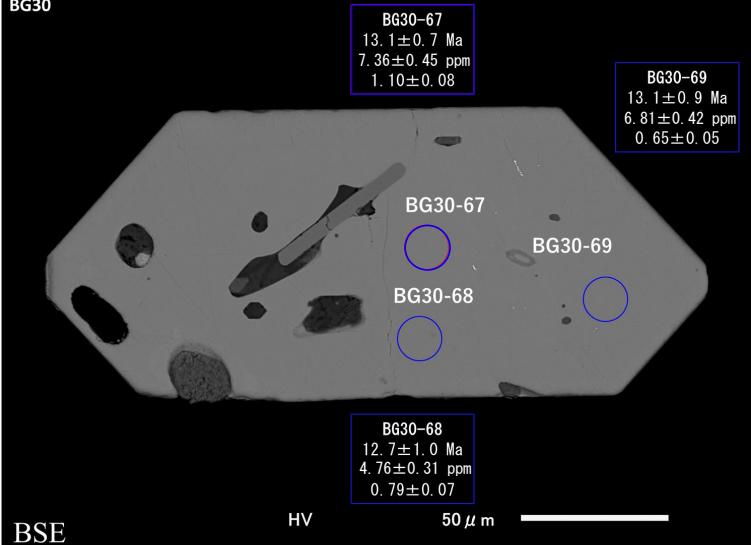
LDT: Local disturbance texture

IHC: Inherited core

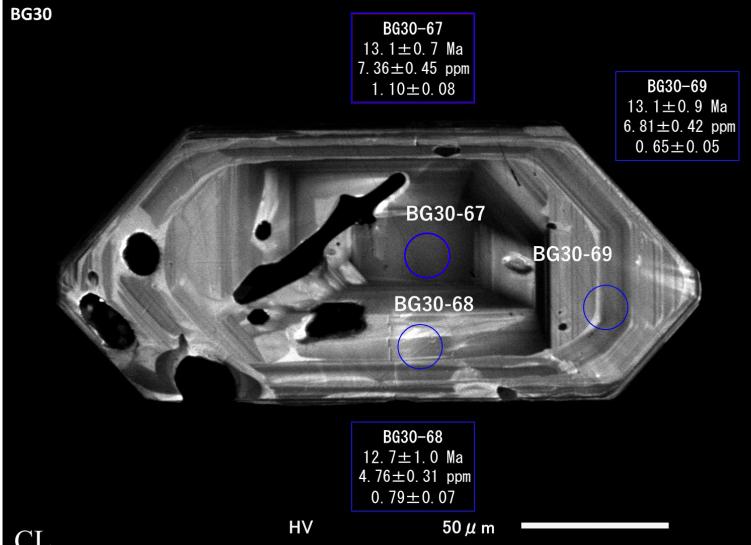
## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :

BG30



BG30



## Morphological description

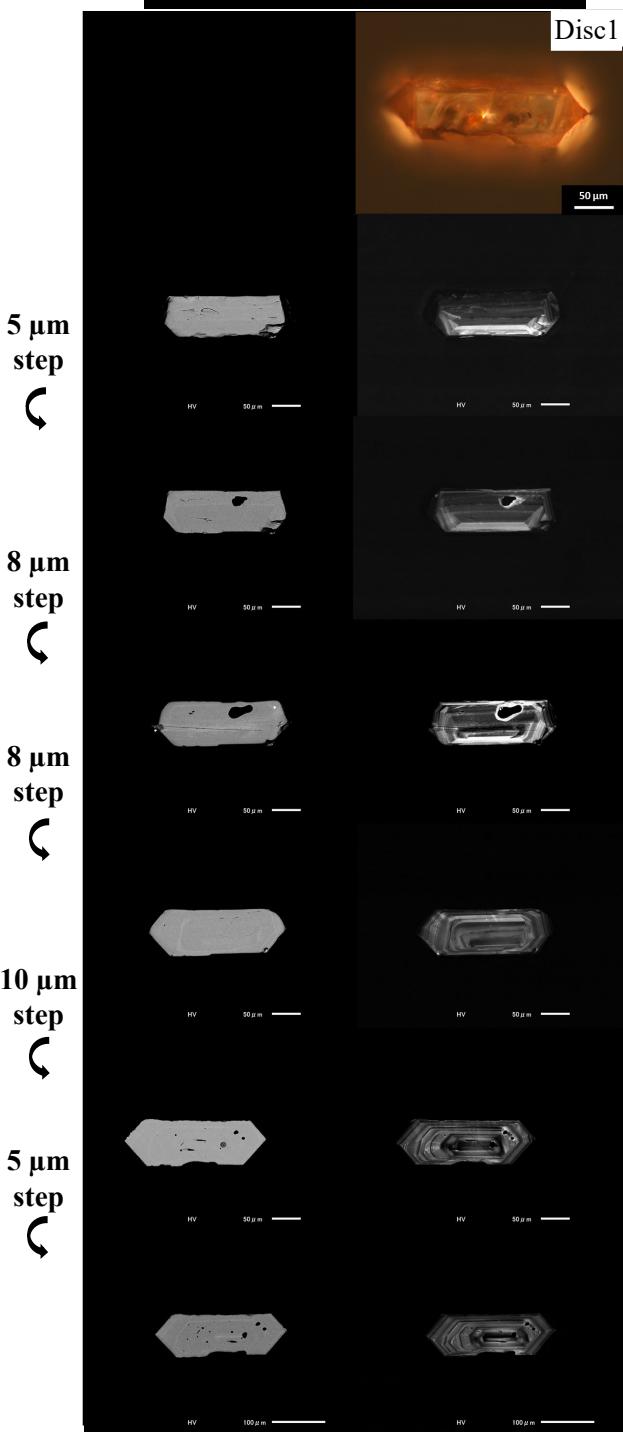
- Type {100}
- Major axis: 230  $\mu\text{m}$
- Minor axis: 100  $\mu\text{m}$
- Major axis/Minor axis: 2.3

## Observed internal texture

- OZ
- PT

Fig. 29 Zircon data of grain No. BG30

## Morphological observation and CL observation for multi-layers



<Legend>

OZ: Oscillatory zoning

PT: Porous texture

CT: Chaotic texture

LDT: Local disturbance texture

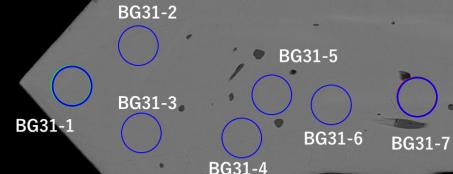
IHC: Inherited core

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :

BG31

BG31-1 12.9±0.9 Ma 4.93±0.40 ppm 0.35±0.02	BG31-2 12.0±1.1 Ma 5.31±0.42 ppm 0.40±0.03	BG31-5 14.6±1.3 Ma 6.73±0.50 ppm 0.85±0.06
---	---	---



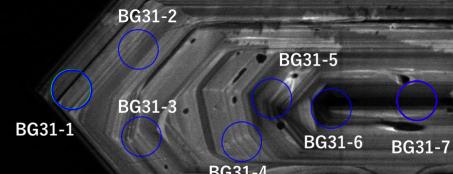
BSE

HV

50 μm

BG31

BG31-1 12.9±0.9 Ma 4.93±0.40 ppm 0.35±0.02	BG31-2 12.0±1.1 Ma 5.31±0.42 ppm 0.40±0.03	BG31-5 14.6±1.3 Ma 6.73±0.50 ppm 0.85±0.06
---	---	---



CL

HV

50 μm

## Morphological description

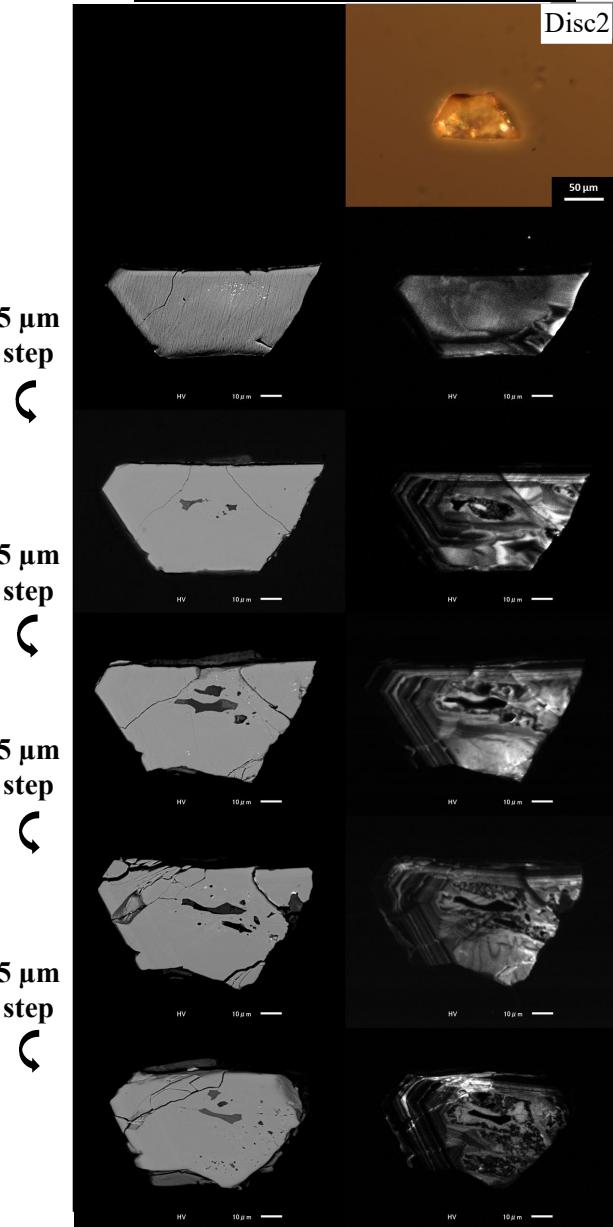
- Type {100}
- Major axis: 261 μm
- Minor axis: 79 μm
- Major axis/Minor axis: 3.3

## Observed internal texture

- OZ
- PT

Fig. 30 Zircon data of grain No. BG31

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

<Legend>

OZ: Oscillatory zoning

PT: Porous texture

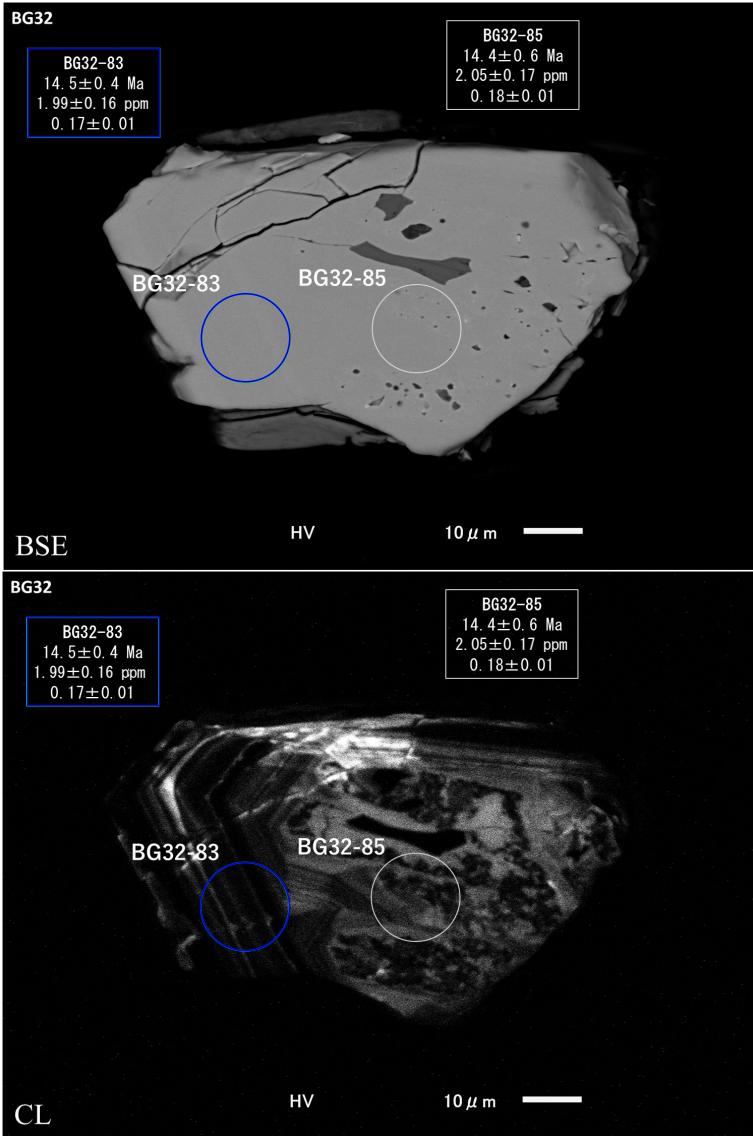
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

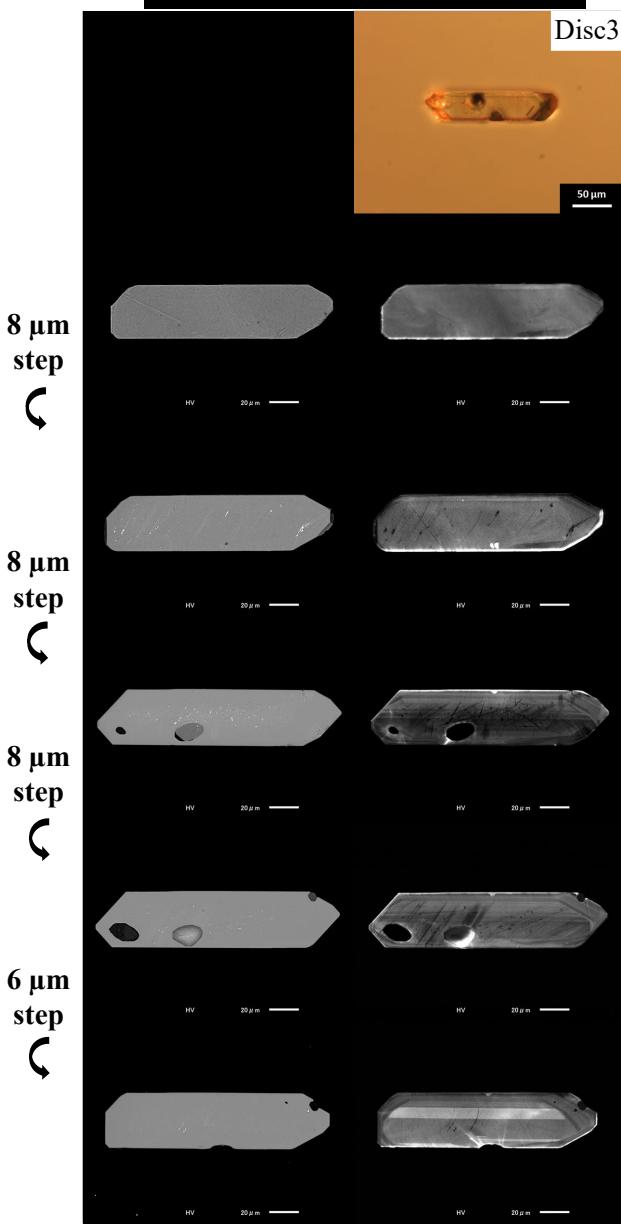
- Type {100}
- Major axis: 112 μm
- Minor axis: 63 μm
- Major axis/Minor axis: 1.8

**Observed internal texture**

- OZ
- PT

Fig. 31 Zircon data of grain No. BG32

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

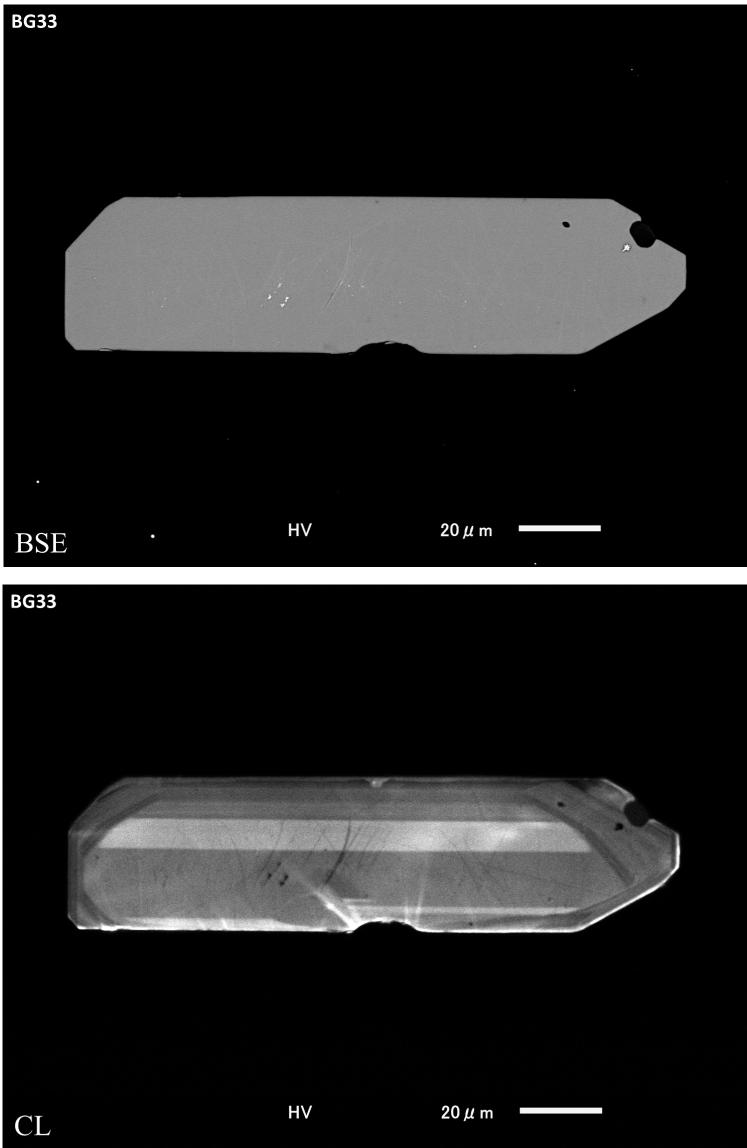
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

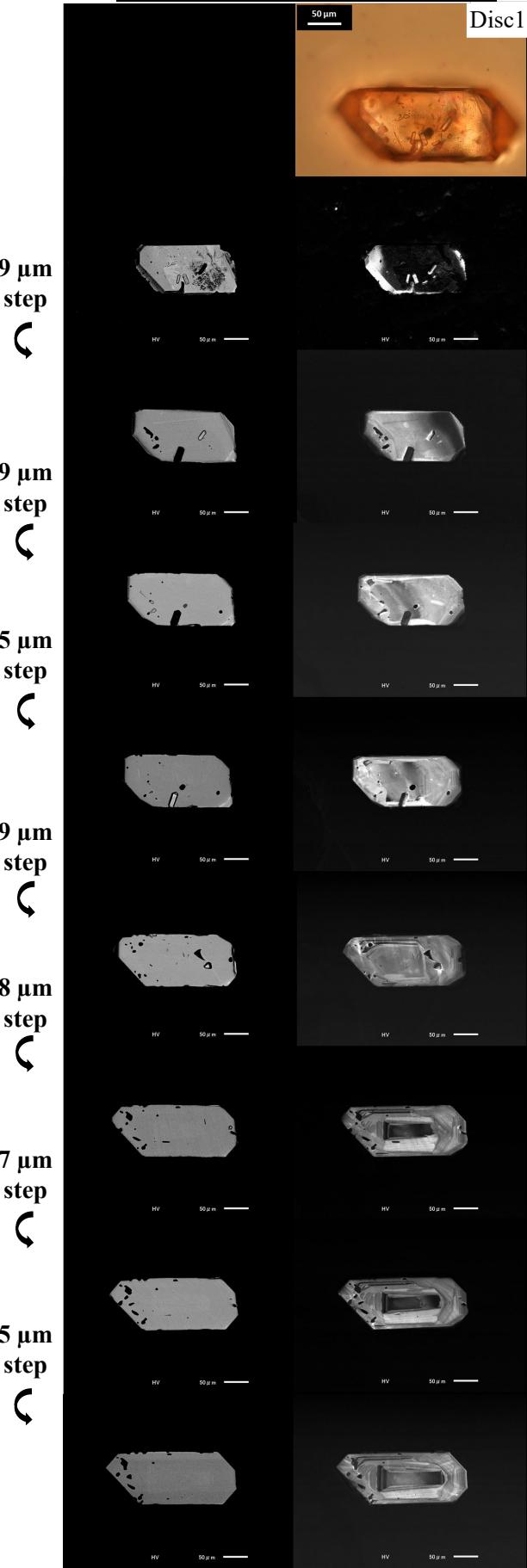
- Type {110}
- Major axis: 170 μm
- Minor axis: 42 μm
- Major axis/Minor axis: 4.1

**Observed internal texture**

- OZ
- PT

Fig. 32 Zircon data of grain No. BG33

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :

HG1

HG1-1  
13.5±1.9 Ma  
1.52±0.30 ppm  
0.22±0.02

HG1-2  
12.0±2.2 Ma  
7.10±0.69 ppm  
0.48±0.05

HG1-9  
17.1±1.5 Ma  
4.82±0.58 ppm  
0.77±0.06

HG1-10  
13.0±2.3 Ma  
5.24±0.58 ppm  
0.53±0.05

HG1-11  
14.5±2.7 Ma  
4.44±0.51 ppm  
0.47±0.05

HG1-1

HG1-3  
15.4±2.5 Ma  
6.46±0.64 ppm  
0.44±0.05

HG1-4  
17.3±1.5 Ma  
4.05±0.48 ppm  
0.69±0.06

HG1-5  
13.1±1.8 Ma  
6.12±0.64 ppm  
0.79±0.07

HG1-6  
15.9±2.7 Ma  
4.55±0.49 ppm  
0.66±0.07

HG1-7  
14.3±2.4 Ma  
4.82±0.54 ppm  
0.63±0.03

HG1-8  
16.3±2.0 Ma  
4.65±0.52 ppm  
0.77±0.07

BSE

HG1

HG1-1  
13.5±1.9 Ma  
1.52±0.30 ppm  
0.22±0.02

HG1-2  
12.0±2.2 Ma  
7.10±0.69 ppm  
0.48±0.05

HG1-9  
17.1±1.5 Ma  
4.82±0.58 ppm  
0.77±0.06

HG1-10  
13.0±2.3 Ma  
5.24±0.58 ppm  
0.53±0.05

HG1-11  
14.5±2.7 Ma  
4.44±0.51 ppm  
0.47±0.05

HG1-1

HG1-3  
15.4±2.5 Ma  
6.46±0.64 ppm  
0.44±0.05

HG1-4  
17.3±1.5 Ma  
4.05±0.48 ppm  
0.69±0.06

HG1-5  
13.1±1.8 Ma  
6.12±0.64 ppm  
0.79±0.07

HG1-6  
15.9±2.7 Ma  
4.55±0.49 ppm  
0.66±0.07

HG1-7  
14.3±2.4 Ma  
4.82±0.54 ppm  
0.63±0.03

HG1-8  
16.3±2.0 Ma  
4.65±0.52 ppm  
0.77±0.07

CL

## Morphological description

- Type {100}
- Major axis: 270  $\mu\text{m}$
- Minor axis: 110  $\mu\text{m}$
- Major axis/Minor axis: 2.5

## Observed internal texture

- OZ
- PT

Fig. 33 Zircon data of grain No. HG1

**BSE images**

**CL images**

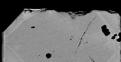
## Morphological observation and CL observation for multi-layers

9  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$

9  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$

5  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$

9  $\mu\text{m}$   
step



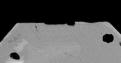
HV 50  $\mu\text{m}$

8  $\mu\text{m}$   
step



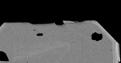
HV 50  $\mu\text{m}$

7  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$

5  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$

CL images

Disc1

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :

HG2

HG2-60  
13.8±1.1 Ma  
6.15±0.38 ppm  
0.81±0.07

HG2-61  
14.8±1.1 Ma  
7.10±0.43 ppm  
0.90±0.07

HG2-64  
11.9±1.2 Ma  
8.27±0.49 ppm  
0.52±0.05

HG2-65  
14.9±0.7 Ma  
4.55±0.31 ppm  
0.39±0.03

BSE

HV

50  $\mu\text{m}$

HG2

HG2-60  
13.8±1.1 Ma  
6.15±0.38 ppm  
0.81±0.07

HG2-61  
14.8±1.1 Ma  
7.10±0.43 ppm  
0.90±0.07

HG2-64  
11.9±1.2 Ma  
8.27±0.49 ppm  
0.52±0.05

HG2-65  
14.9±0.7 Ma  
4.55±0.31 ppm  
0.39±0.03

CL

HV

50  $\mu\text{m}$

## Morphological description

- Type {100}
- Major axis: 265  $\mu\text{m}$
- Minor axis: 118  $\mu\text{m}$
- Major axis/Minor axis: 2.2

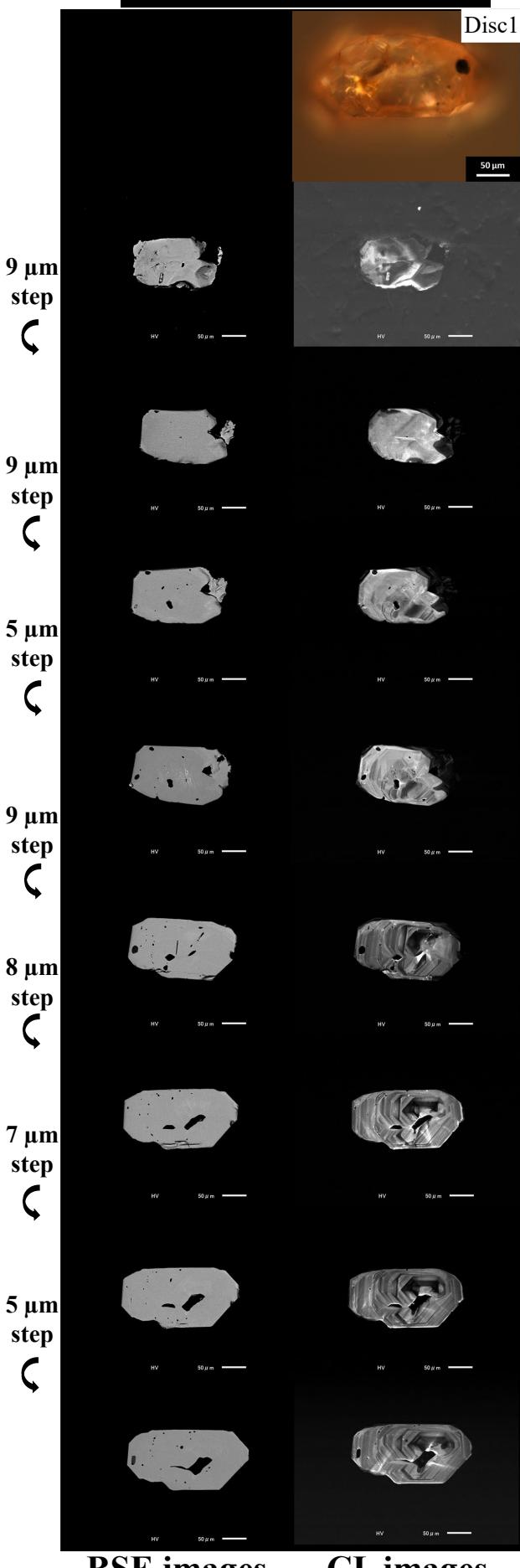
## Observed internal texture

- OZ
- LDT

Fig. 34 Zircon data of grain No. HG2

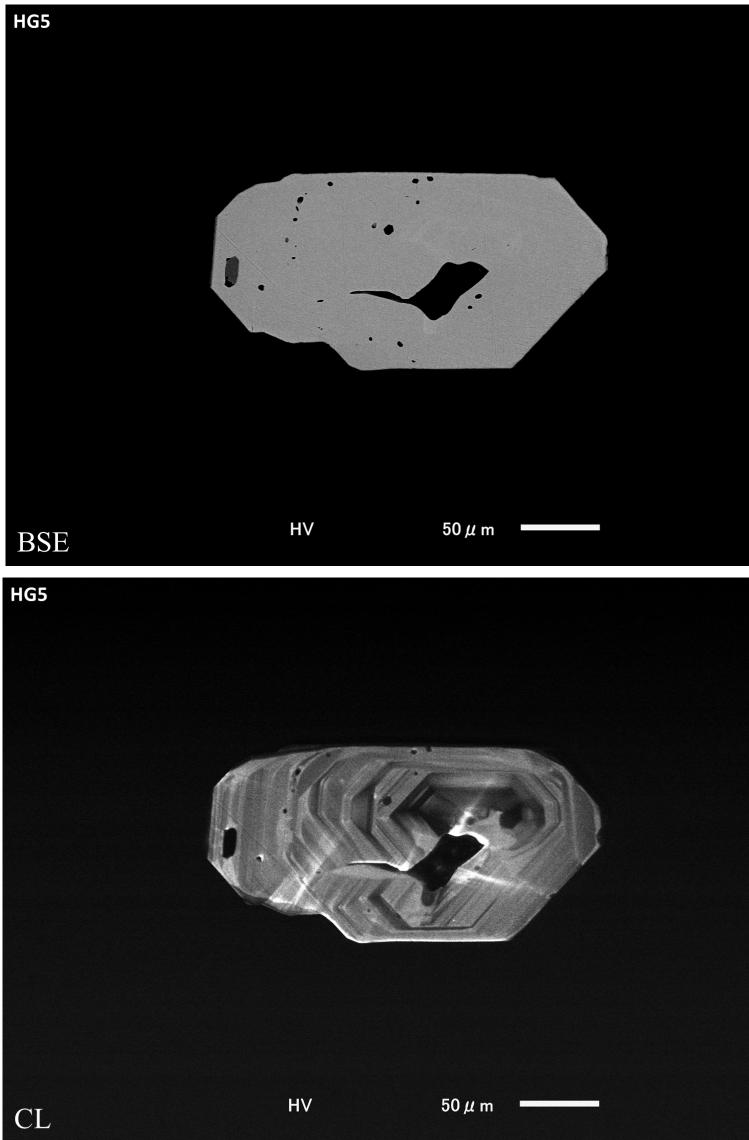
BSE images

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

- Type {100}
- Major axis: 250  $\mu\text{m}$
- Minor axis: 124  $\mu\text{m}$
- Major axis/Minor axis: 2.0

**Observed internal texture**

- OZ
- PT

Fig. 35 Zircon data of grain No. HG5

**BSE images**

**CL images**

## Morphological observation and CL observation for multi-layers

9  $\mu\text{m}$   
step



9  $\mu\text{m}$   
step



5  $\mu\text{m}$   
step



9  $\mu\text{m}$   
step



8  $\mu\text{m}$   
step



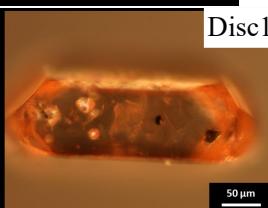
7  $\mu\text{m}$   
step



5  $\mu\text{m}$   
step



Disc1



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :

HG6

HG6-12  
437.0  $\pm$  17.4 Ma  
14.93  $\pm$  1.13 ppm  
0.16  $\pm$  0.02

HG6-16  
13.9  $\pm$  2.0 Ma  
5.87  $\pm$  0.59 ppm  
0.52  $\pm$  0.05

BSE

HG6-13  
13.1  $\pm$  2.5 Ma  
4.60  $\pm$  0.50 ppm  
0.07  $\pm$  0.01

HG6-14  
13.3  $\pm$  2.0 Ma  
7.41  $\pm$  0.67 ppm  
0.61  $\pm$  0.06

HG6-18  
11.3  $\pm$  1.6 Ma  
4.34  $\pm$  0.46 ppm  
0.48  $\pm$  0.04

HG6-12  
437.0  $\pm$  17.4 Ma  
14.93  $\pm$  1.13 ppm  
0.16  $\pm$  0.02

HG6-16  
13.9  $\pm$  2.0 Ma  
5.87  $\pm$  0.59 ppm  
0.52  $\pm$  0.05

CL

HG6-13  
13.1  $\pm$  2.5 Ma  
4.60  $\pm$  0.50 ppm  
0.07  $\pm$  0.01

HG6-14  
13.3  $\pm$  2.0 Ma  
7.41  $\pm$  0.67 ppm  
0.61  $\pm$  0.06

HG6-18  
11.3  $\pm$  1.6 Ma  
4.34  $\pm$  0.46 ppm  
0.48  $\pm$  0.04

## Morphological description

- Type {100}
- Major axis: 319  $\mu\text{m}$
- Minor axis: 100  $\mu\text{m}$
- Major axis/Minor axis: 3.2

## Observed internal texture

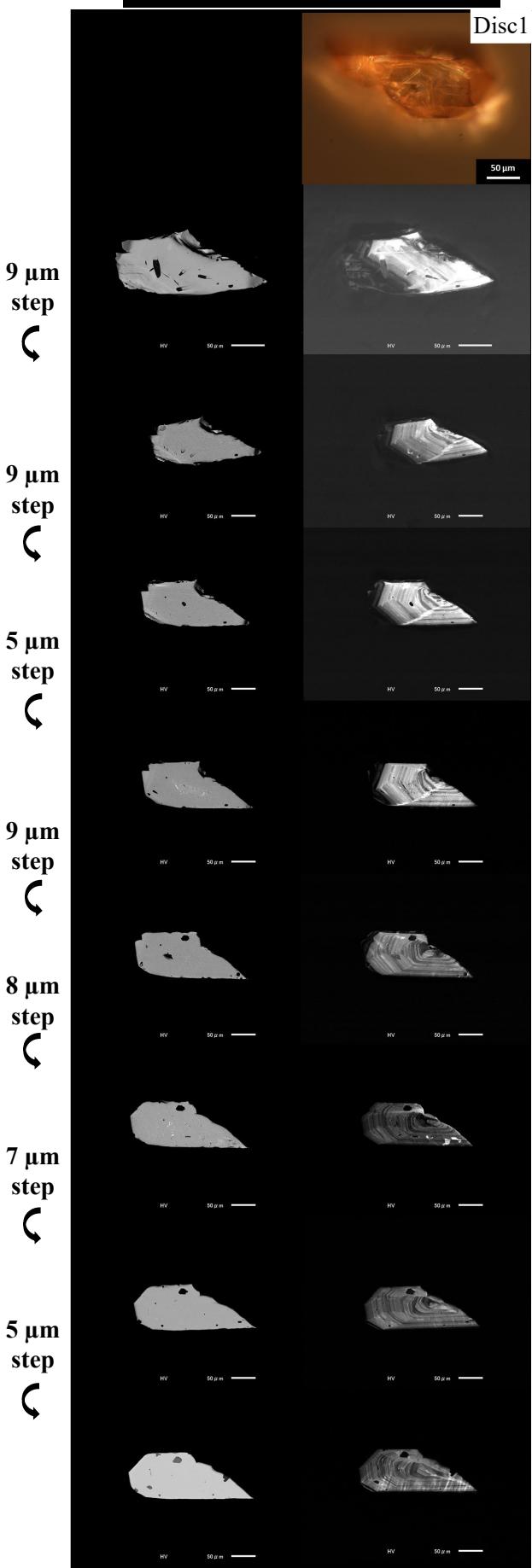
- OZ
- IHC

Fig. 36 Zircon data of grain No. HG6

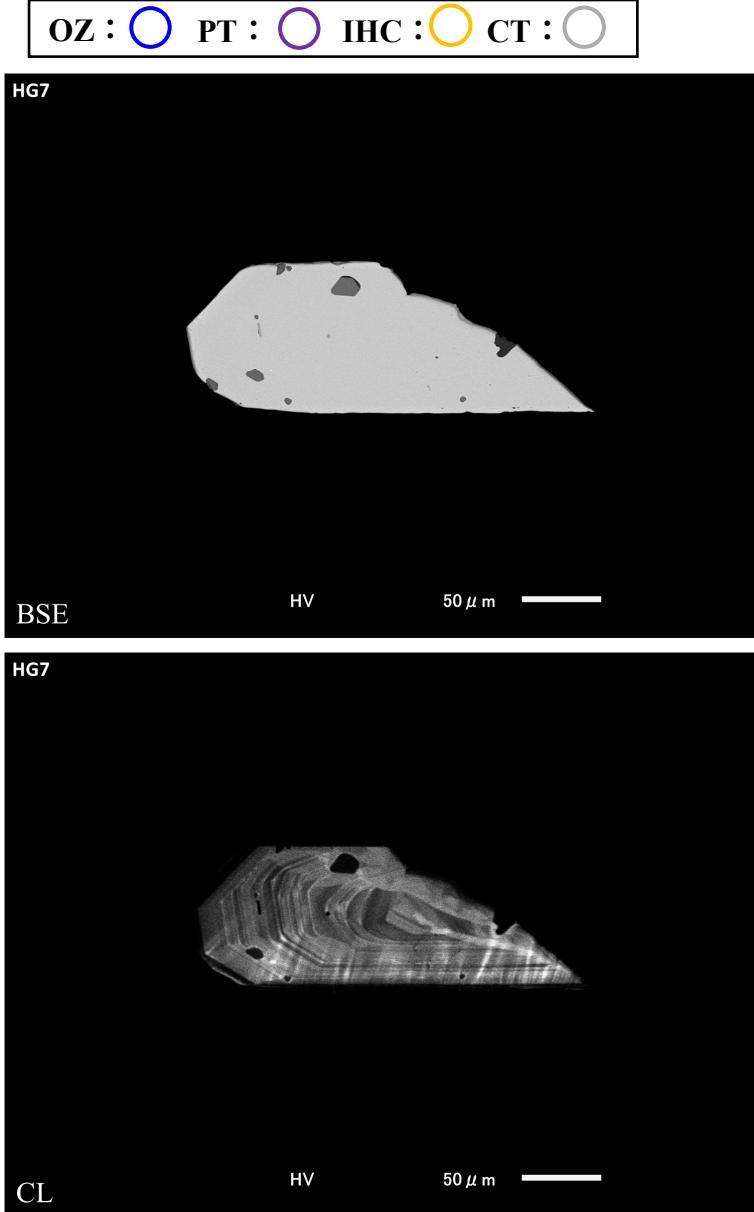
BSE images

CL images

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**



**Morphological description**

- Type {100}
- Major axis: 237  $\mu$ m
- Minor axis: 94  $\mu$ m
- Major axis/Minor axis: 2.5

**Observed internal texture**

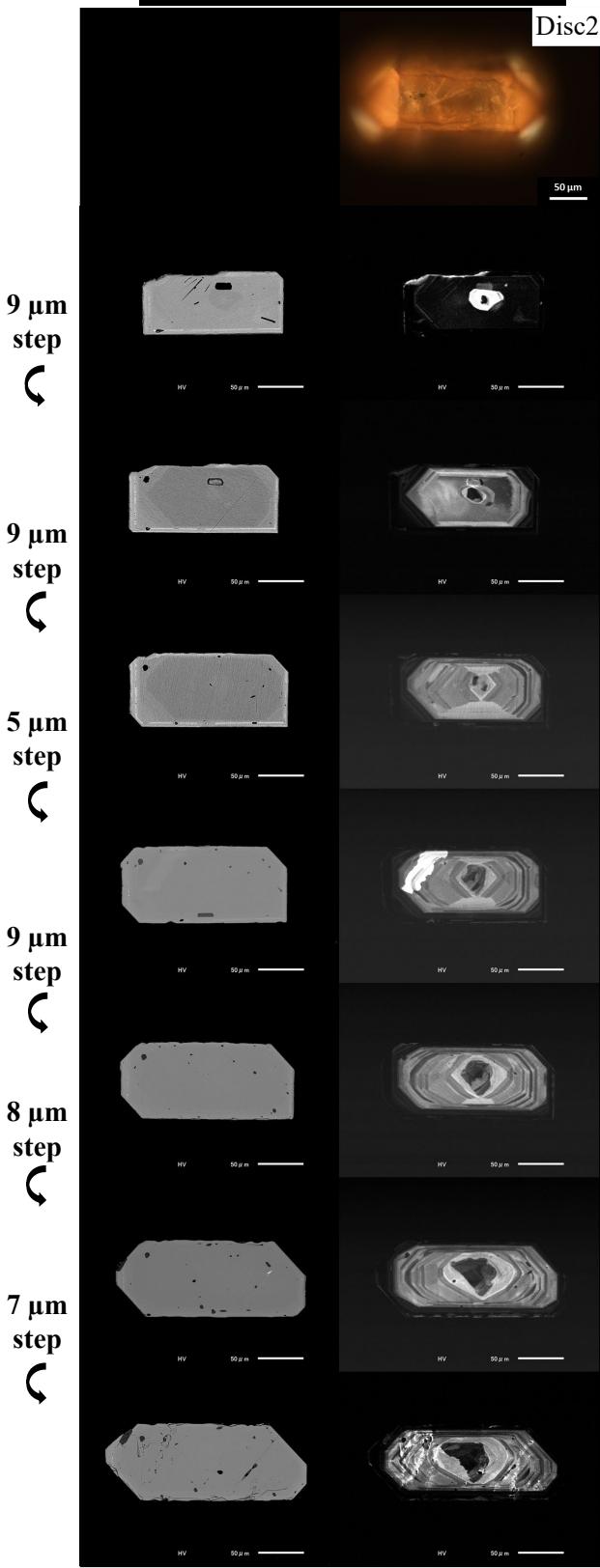
- OZ
- PT

Fig. 37 Zircon data of grain No. HG7

**BSE images**

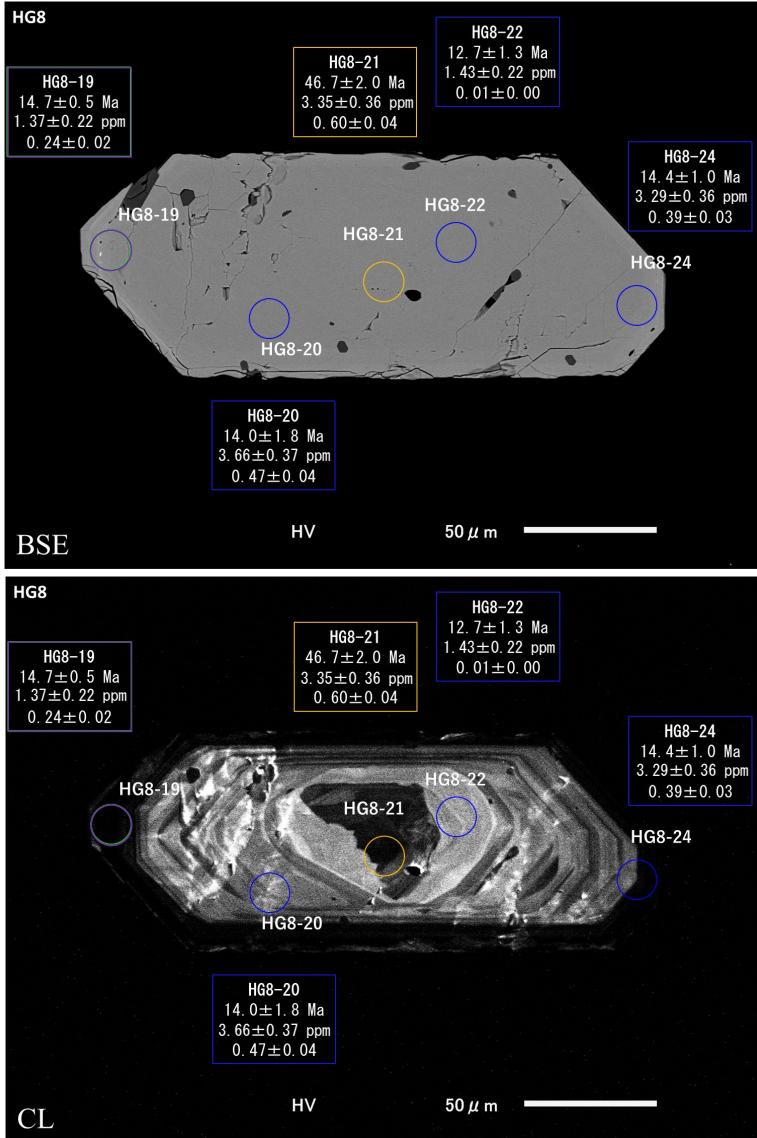
**CL images**

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

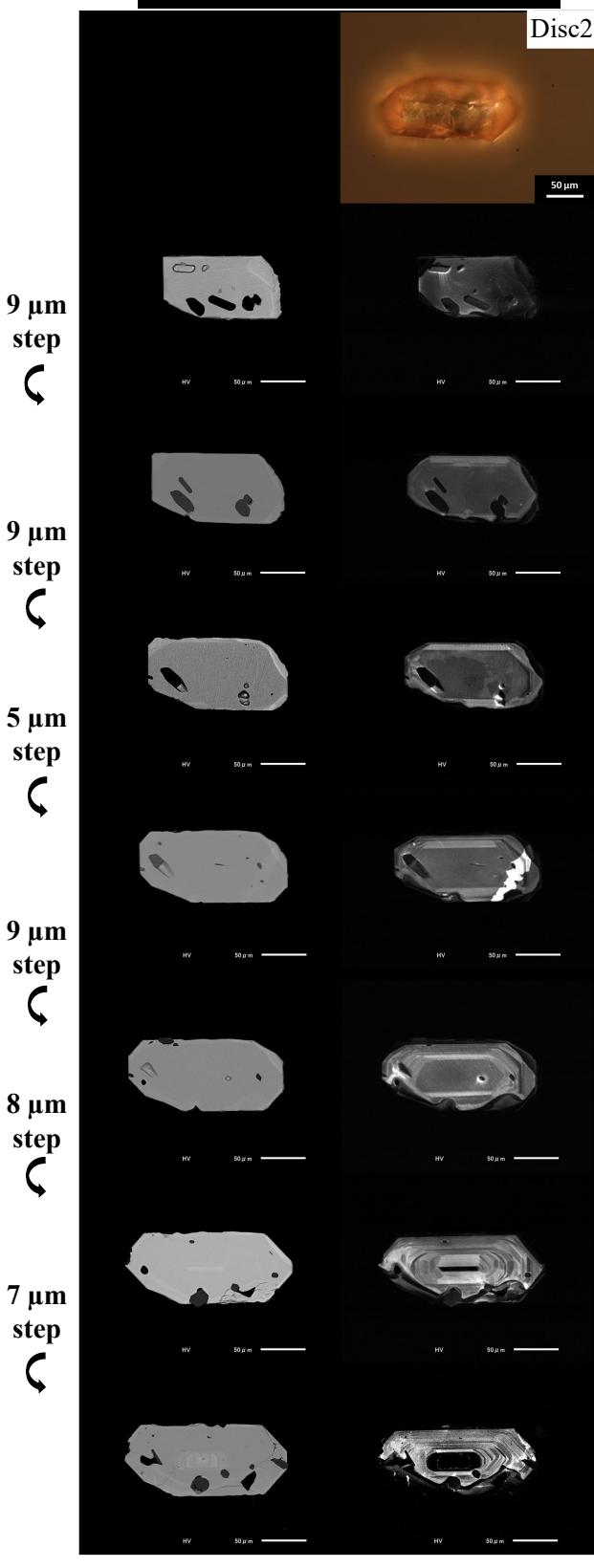
- Type {100}
- Major axis: 241 µm
- Minor axis: 80 µm
- Major axis/Minor axis: 3.0

## Observed internal texture

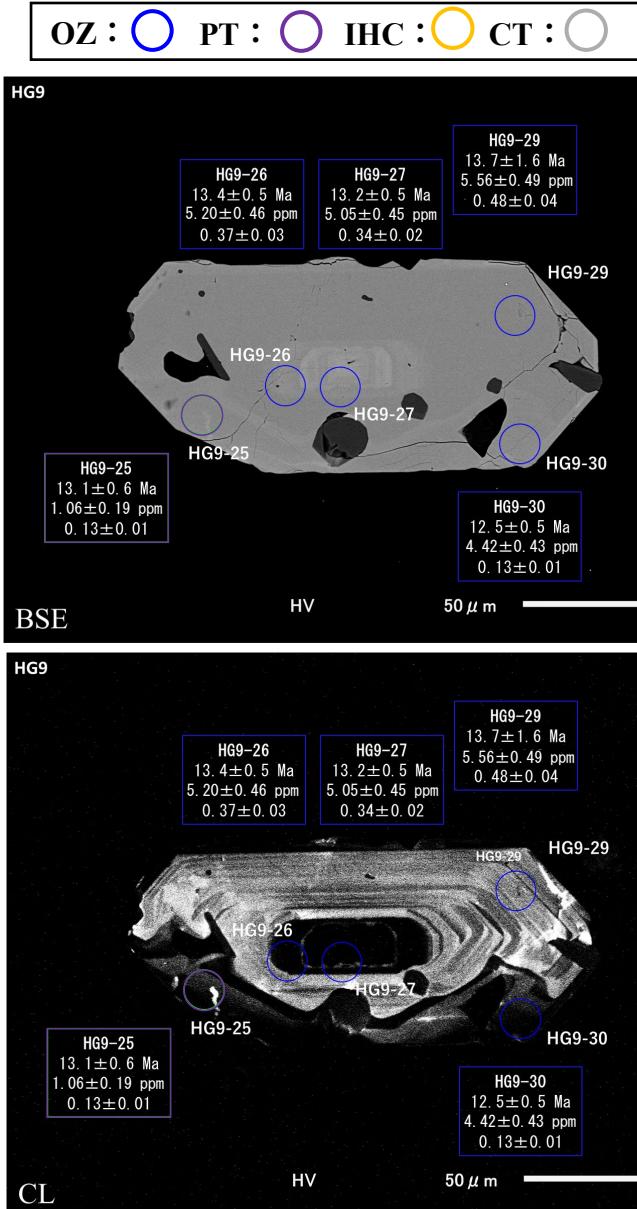
- OZ
- PT
- IHC

Fig. 38 Zircon data of grain No. HG8

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio



## Morphological description

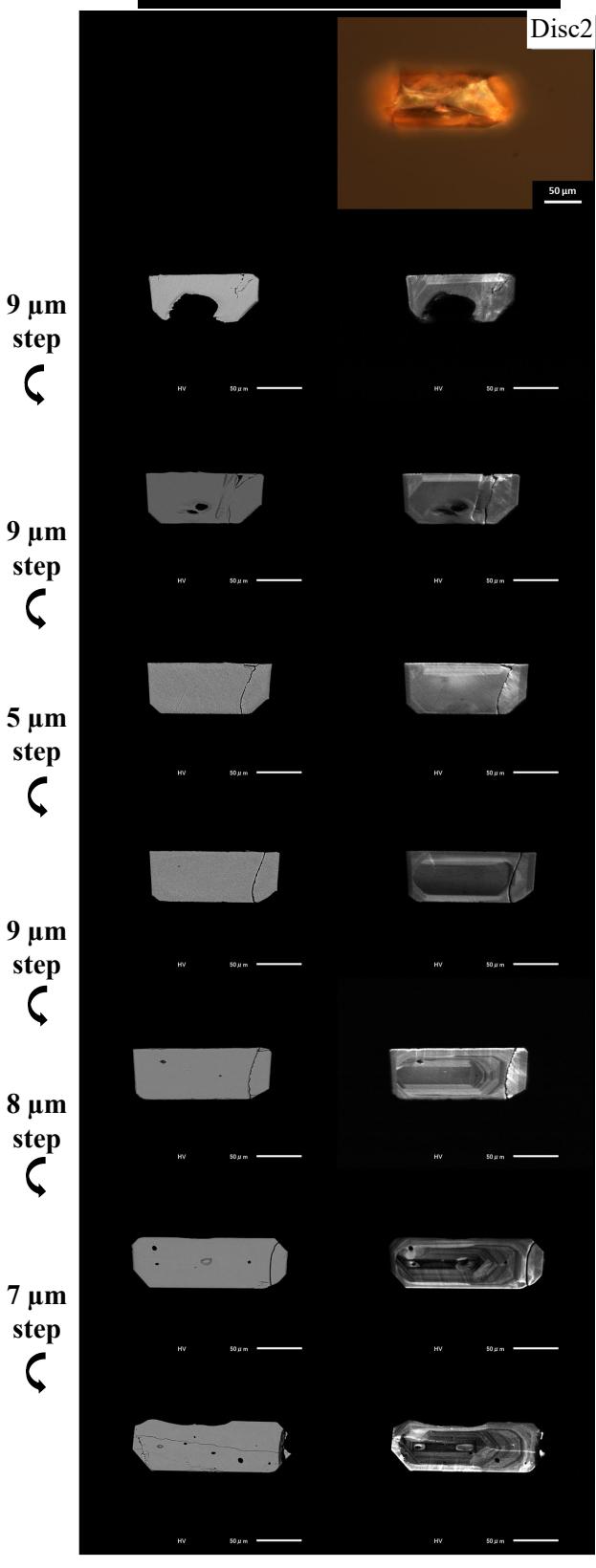
- Type {100}
- Major axis: 194 μm
- Minor axis: 84 μm
- Major axis/Minor axis: 2.3

## Observed internal texture

- OZ
- PT

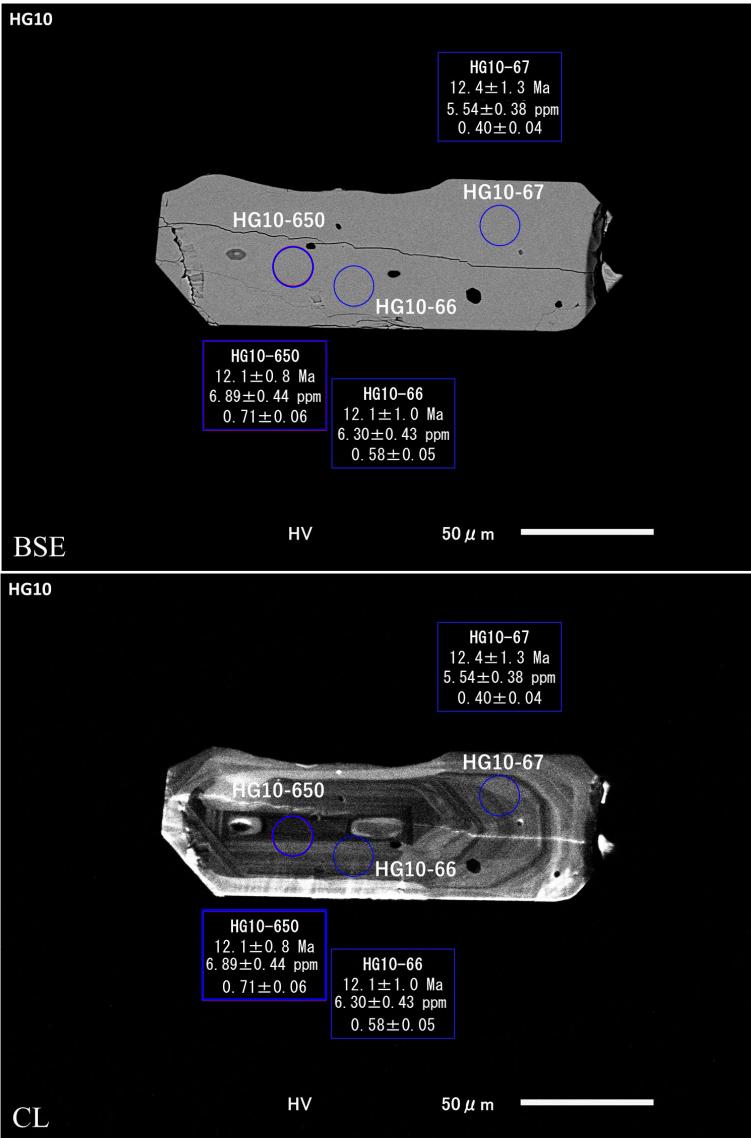
Fig. 39 Zircon data of grain No. HG9

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

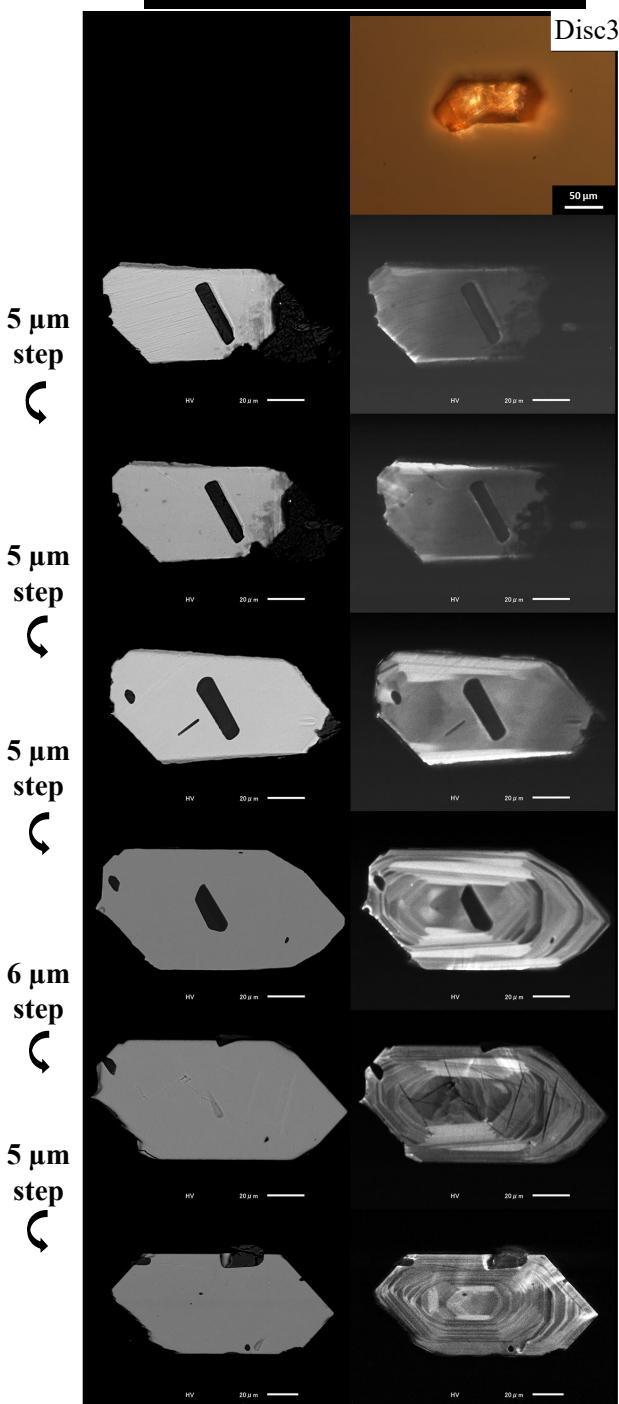
- Type –not classified
- Major axis: 184 μm
- Minor axis: 79 μm
- Major axis/Minor axis: 2.3

## Observed internal texture

- OZ
- PT

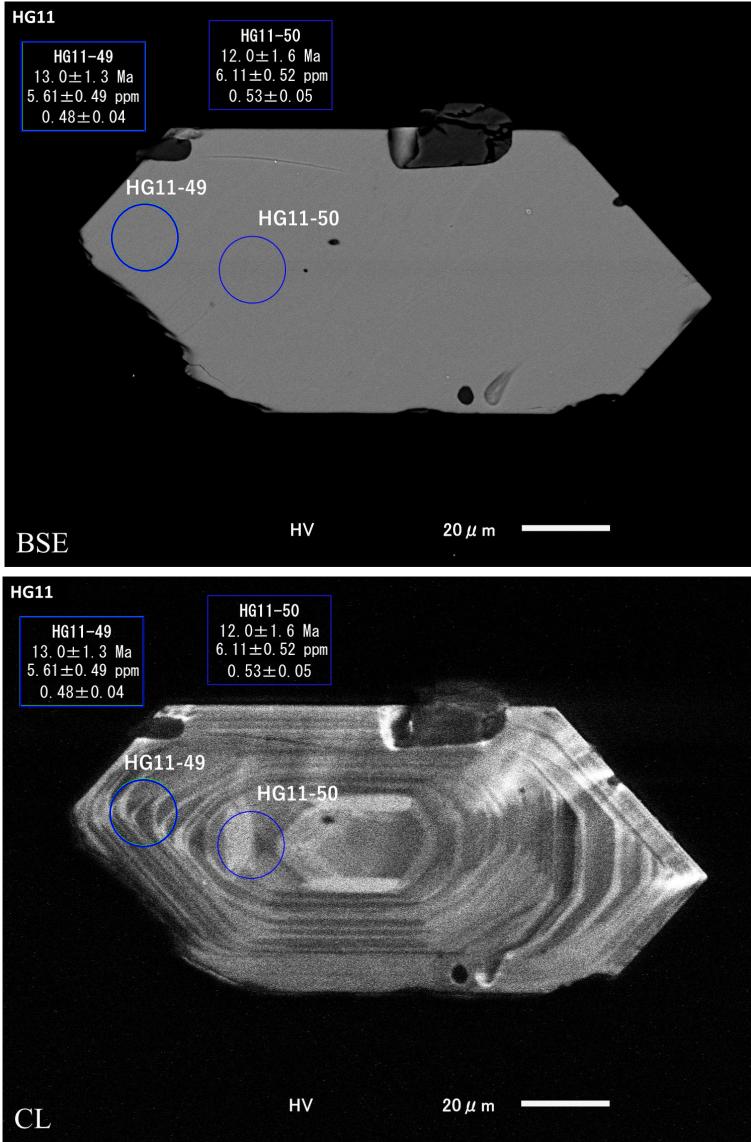
Fig. 40 Zircon data of grain No. HG10

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

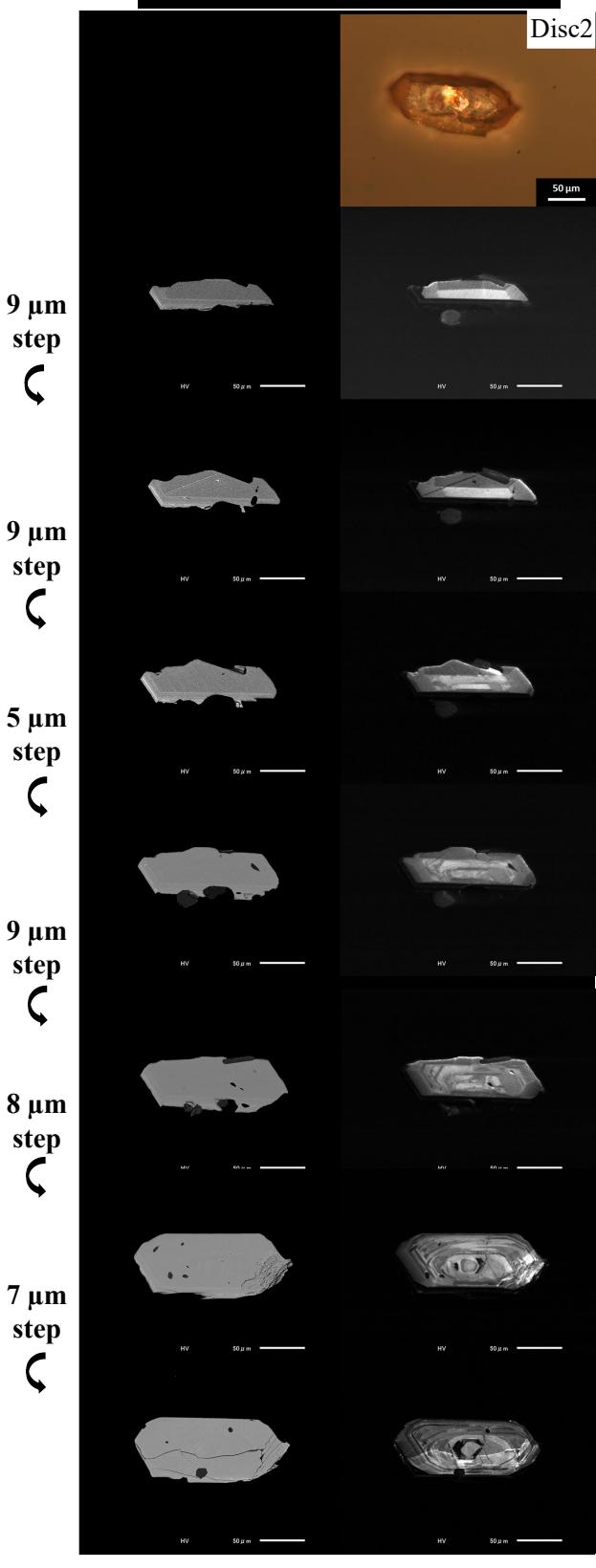
- Type –not classified
- Major axis: 135 μm
- Minor axis: 54 μm
- Major axis/Minor axis: 2.5

**Observed internal texture**

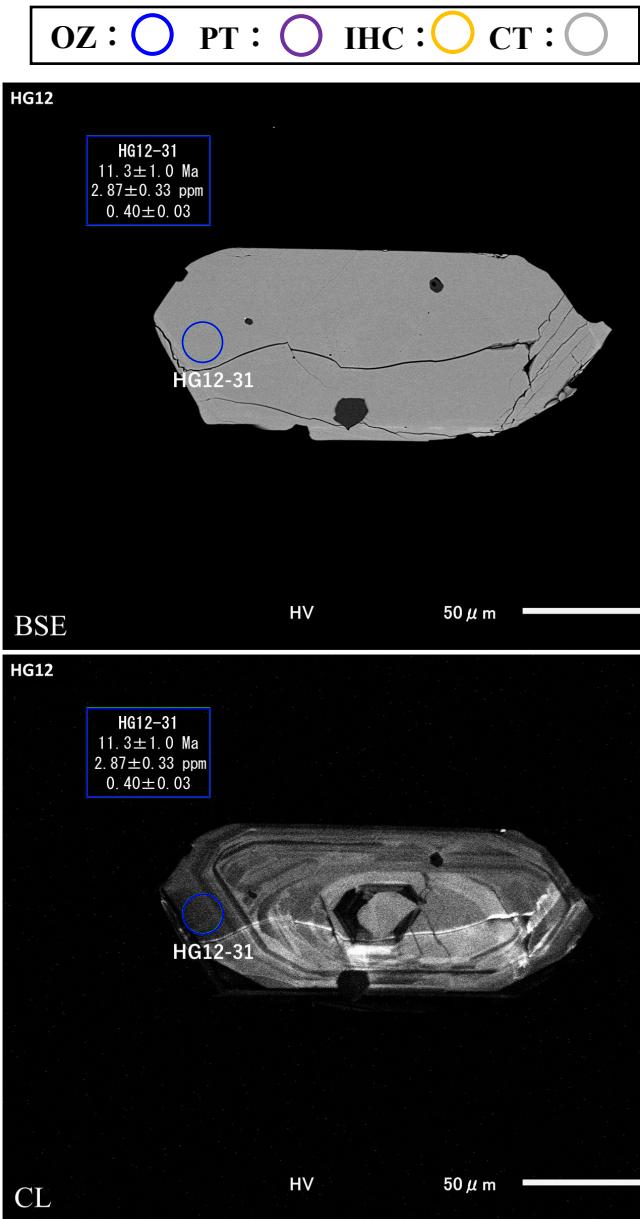
- OZ

Fig. 41 Zircon data of grain No. HG11

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**



**Morphological description**

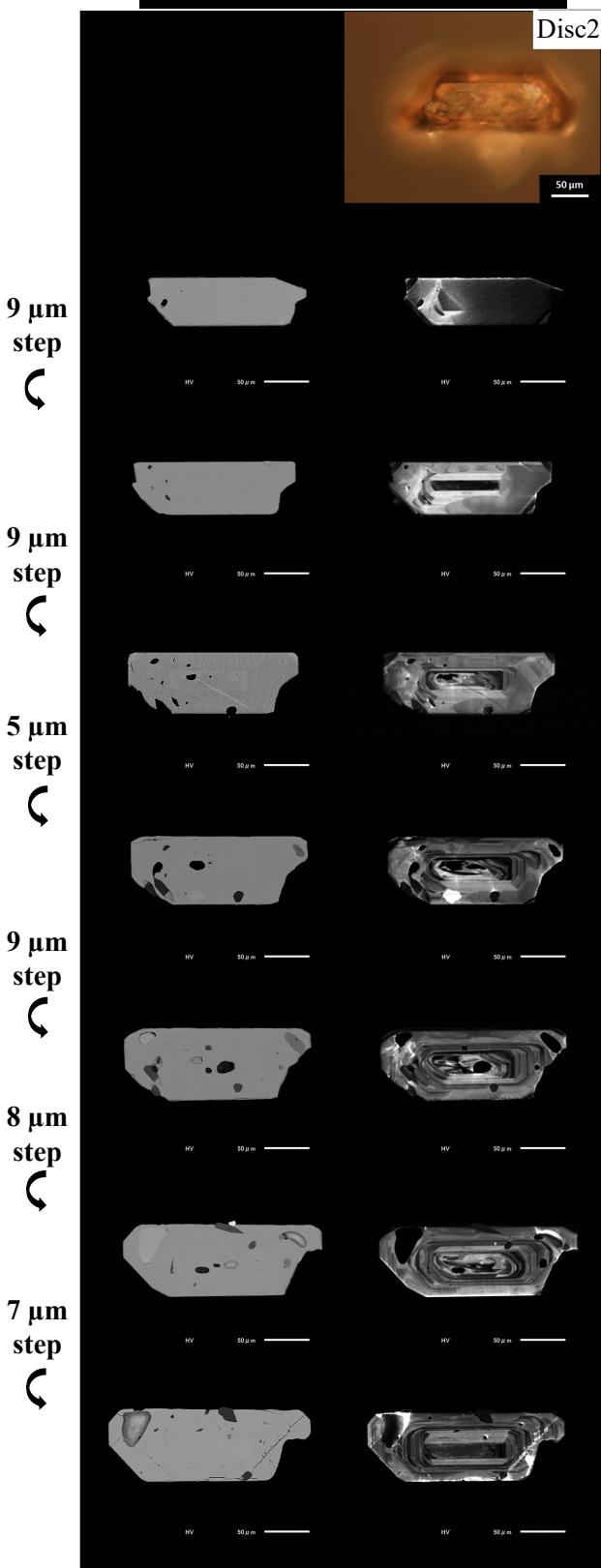
- Type {100}
- Major axis: 176 μm
- Minor axis: 79 μm
- Major axis/Minor axis: 2.2

**Observed internal texture**

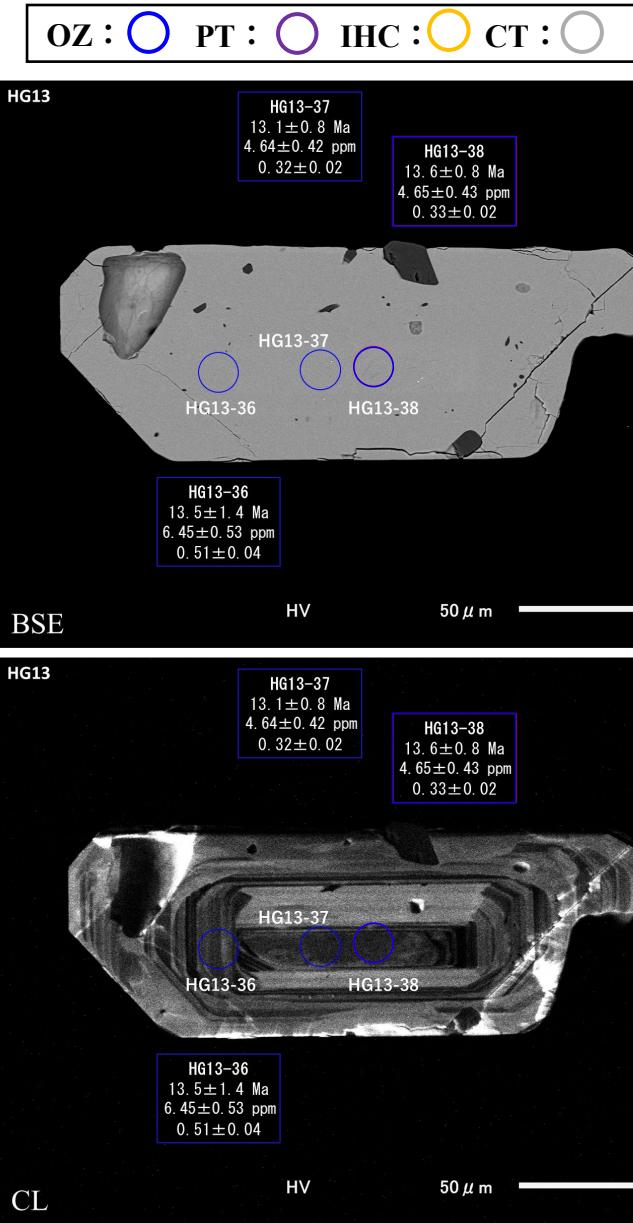
- OZ
- IHC

Fig. 42 Zircon data of grain No. HG12

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio



## Morphological description

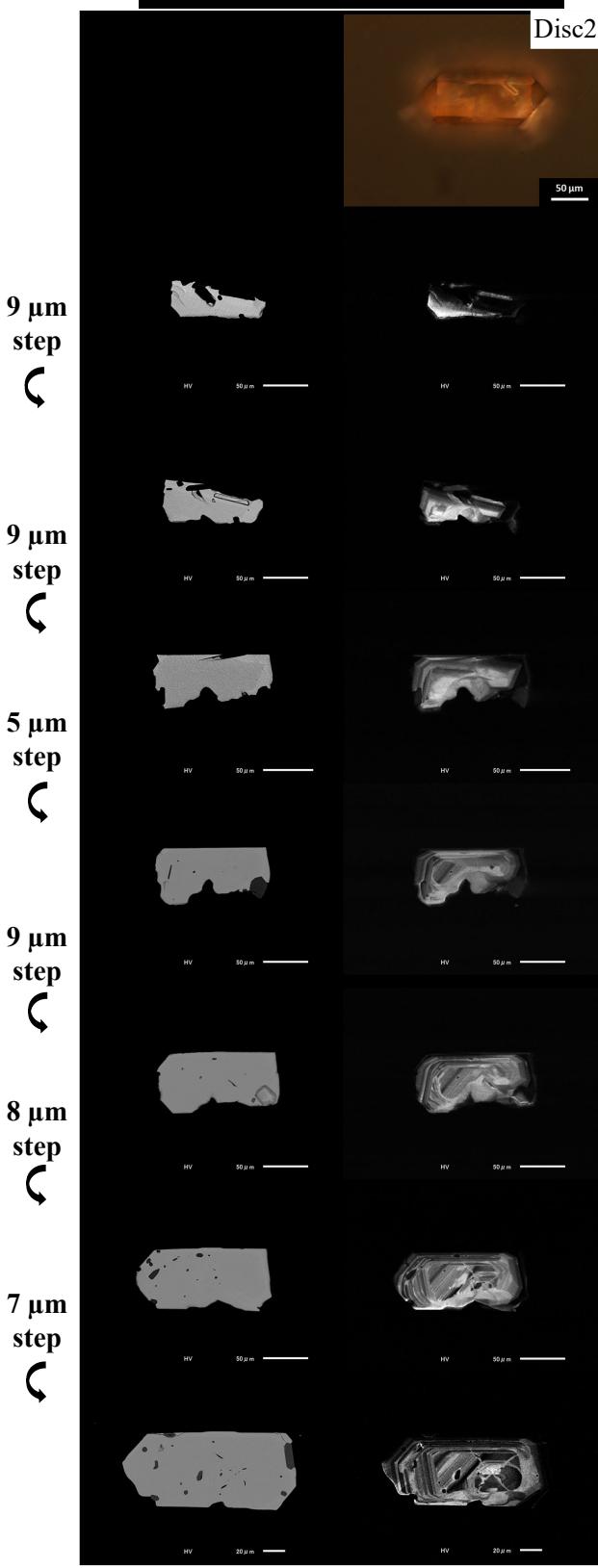
- Type {110}
- Major axis: 205  $\mu\text{m}$
- Minor axis: 80  $\mu\text{m}$
- Major axis/Minor axis: 2.6

## Observed internal texture

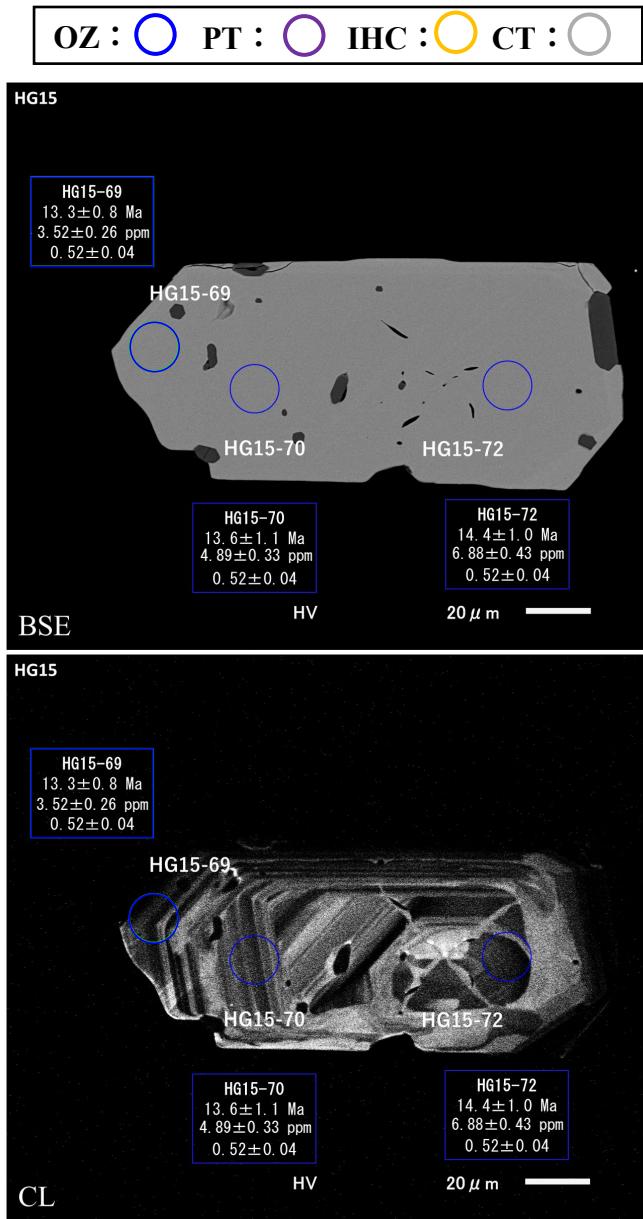
- OZ
- PT

Fig. 43 Zircon data of grain No. HG13

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio



## Morphological description

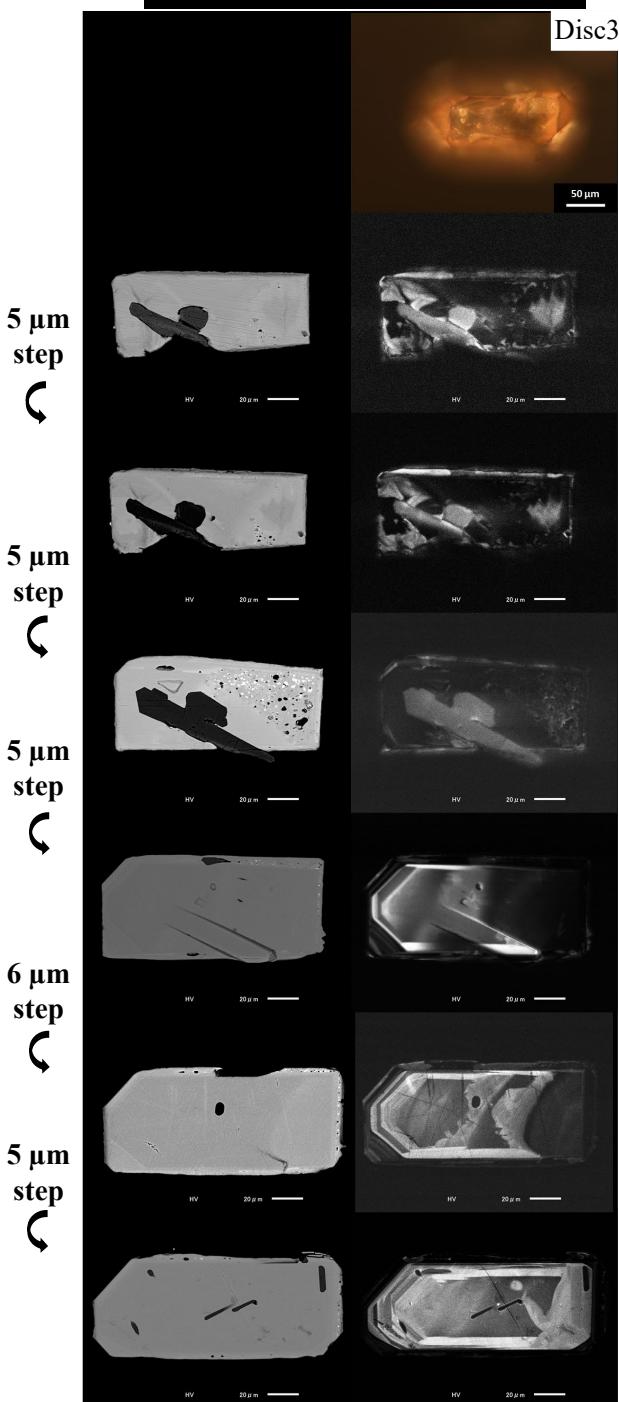
- Type {100}
- Major axis: 160 μm
- Minor axis: 70 μm
- Major axis/Minor axis: 2.3

## Observed internal texture

- OZ
- CT

Fig. 44 Zircon data of grain No. HG15

**Morphological observation and CL observation for multi-layers**

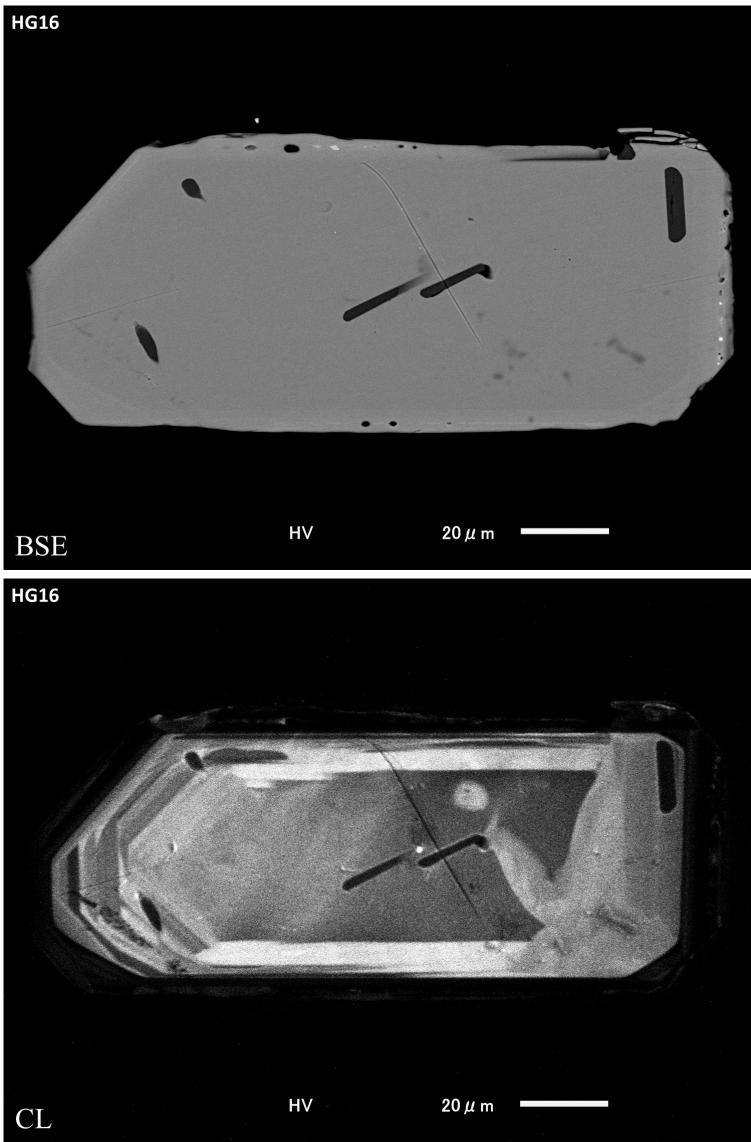


BSE images

CL images

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

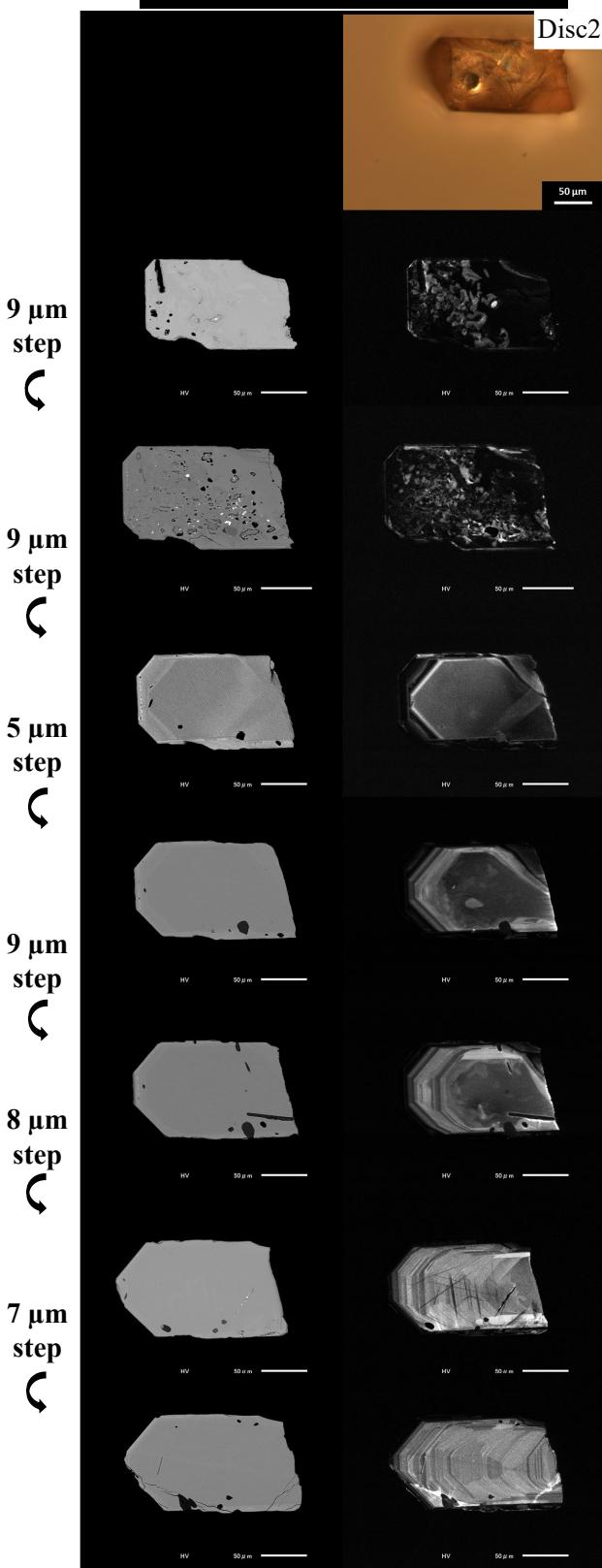
- Type {100}
- Major axis: 178 μm
- Minor axis: 65 μm
- Major axis/Minor axis: 2.8

**Observed internal texture**

- OZ
- PT

Fig. 45 Zircon data of grain No. HG16

**Morphological observation and CL observation for multi-layers**

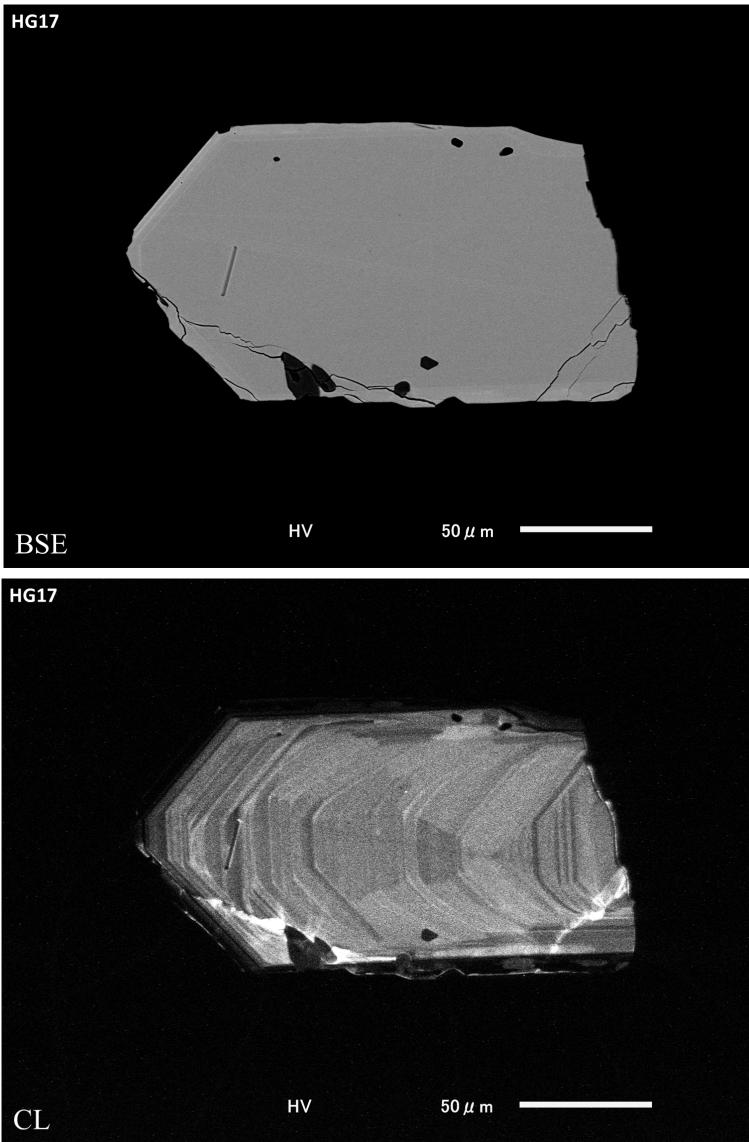


**BSE images**

**CL images**

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

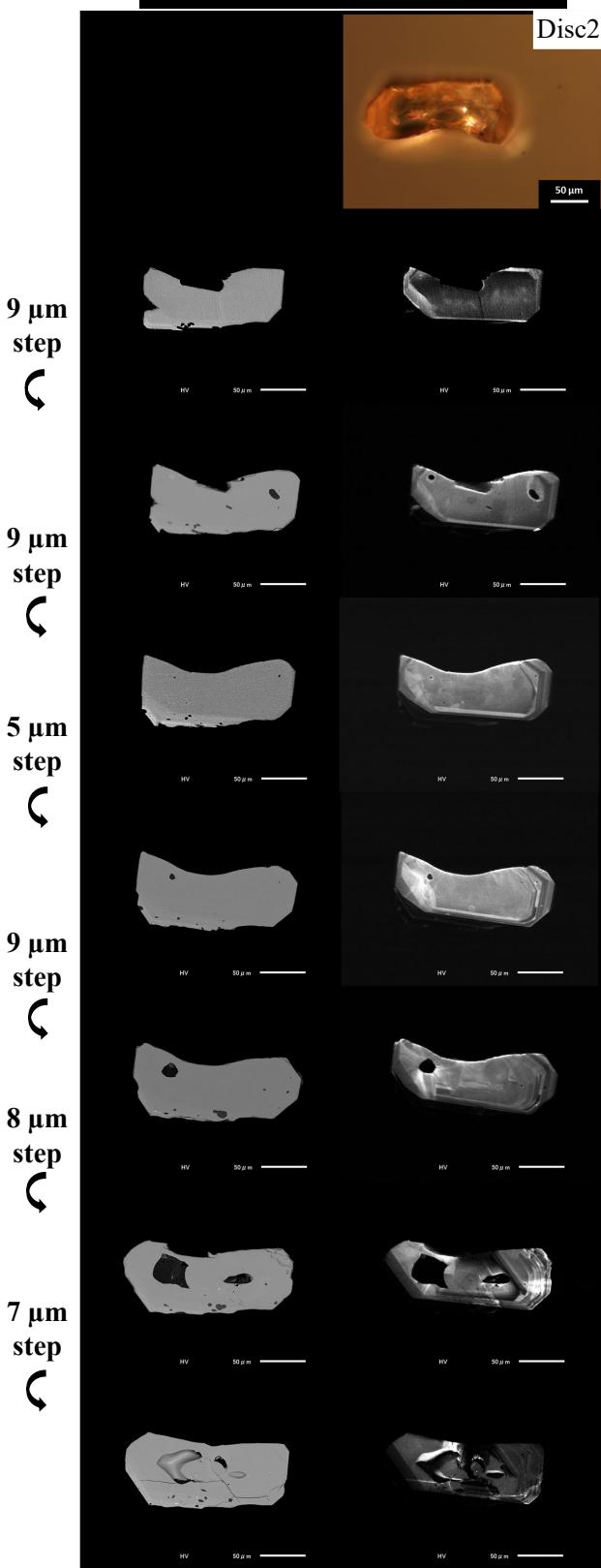
- Type {100}
- Major axis: 201 μm
- Minor axis: 98 μm
- Major axis/Minor axis: 2.0

**Observed internal texture**

- OZ
- PT

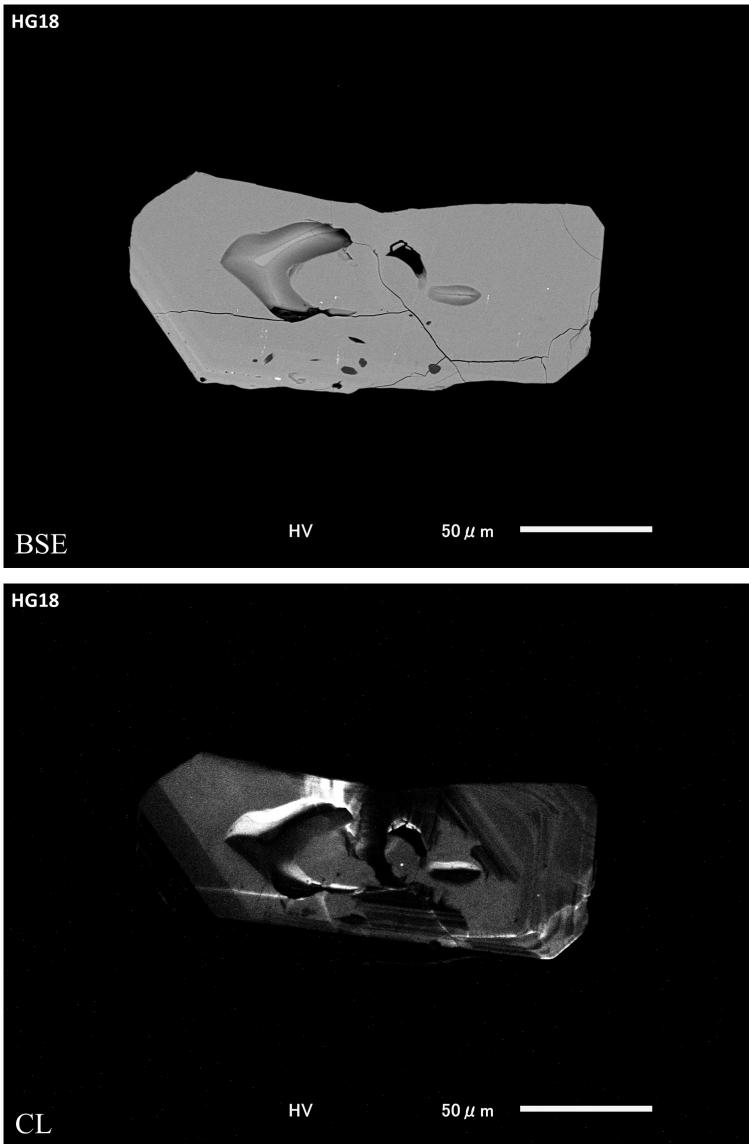
Fig. 46 Zircon data of grain No. HG17

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

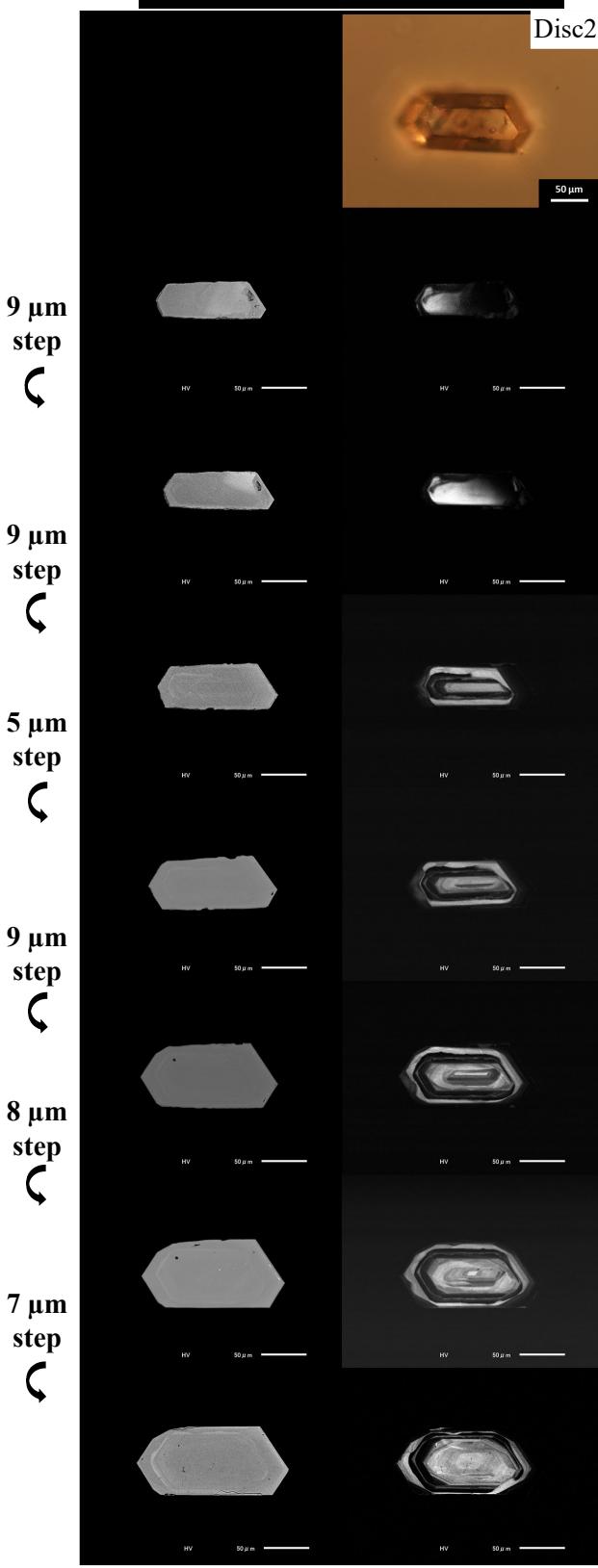
- Type –not classified
- Major axis: 196 μm
- Minor axis: 84 μm
- Major axis/Minor axis: 2.3

**Observed internal texture**

- OZ
- PT

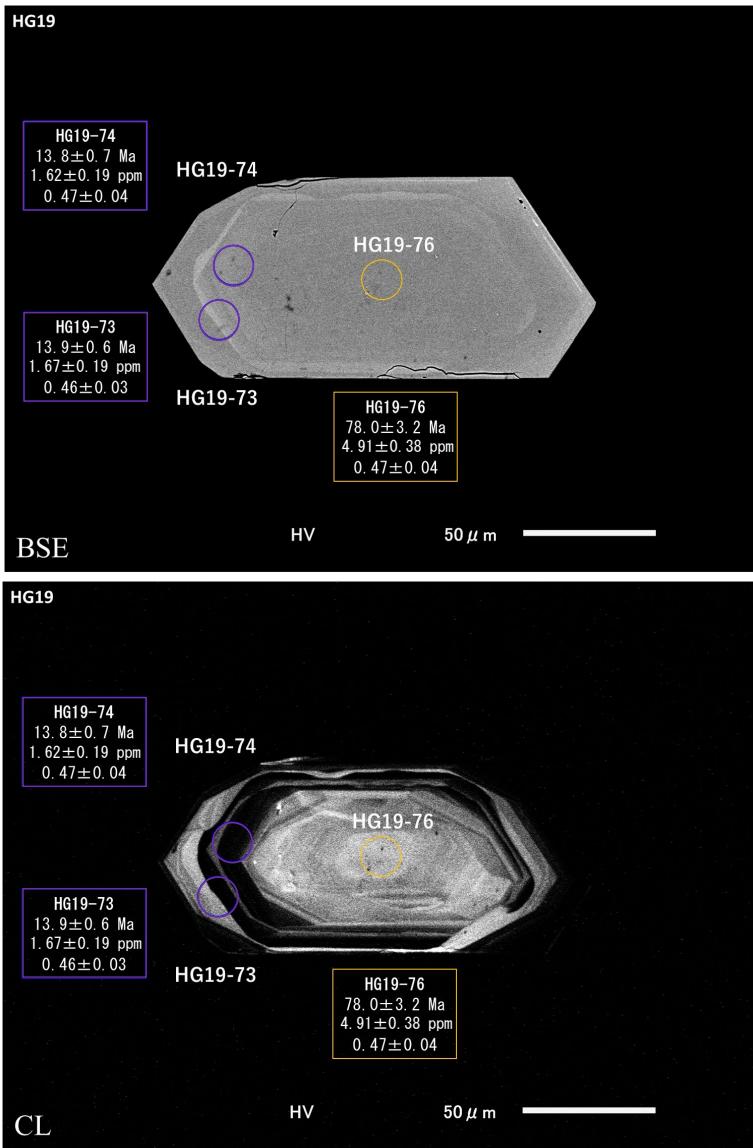
Fig. 47 Zircon data of grain No. HG18

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

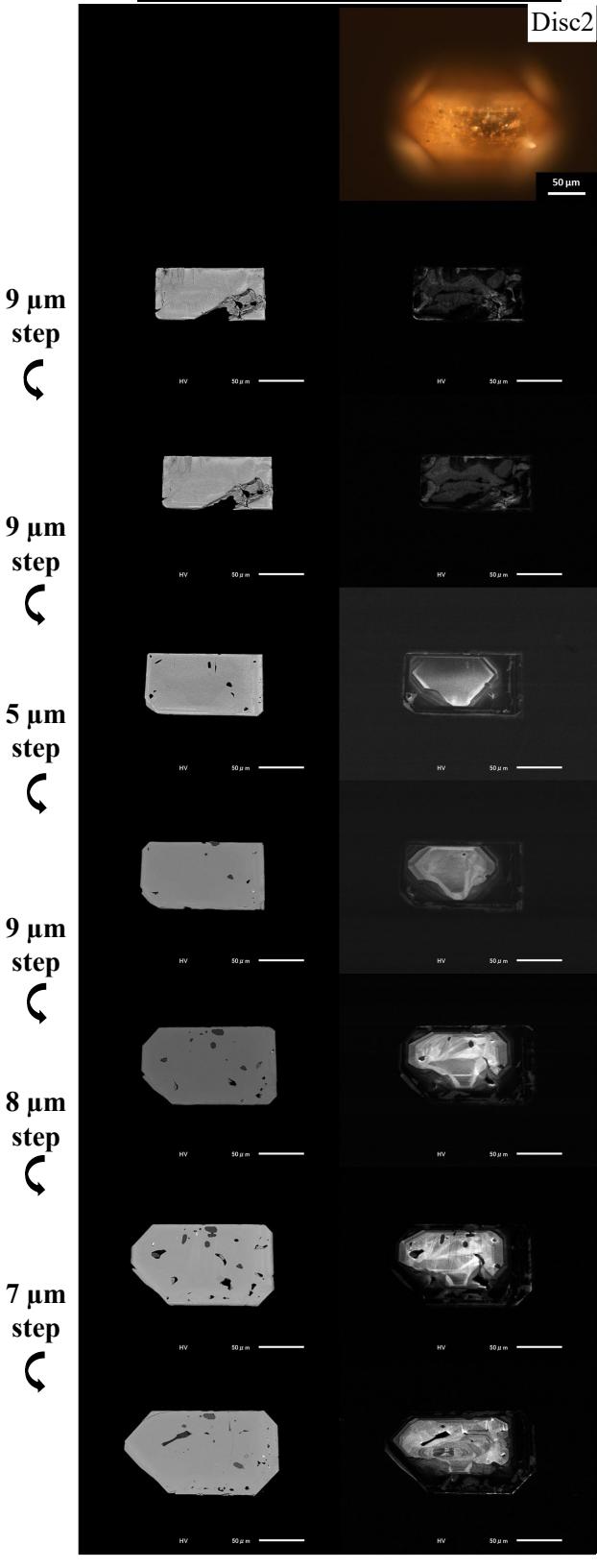
- Type {110}
- Major axis: 181  $\mu\text{m}$
- Minor axis: 77  $\mu\text{m}$
- Major axis/Minor axis: 2.3

## Observed internal texture

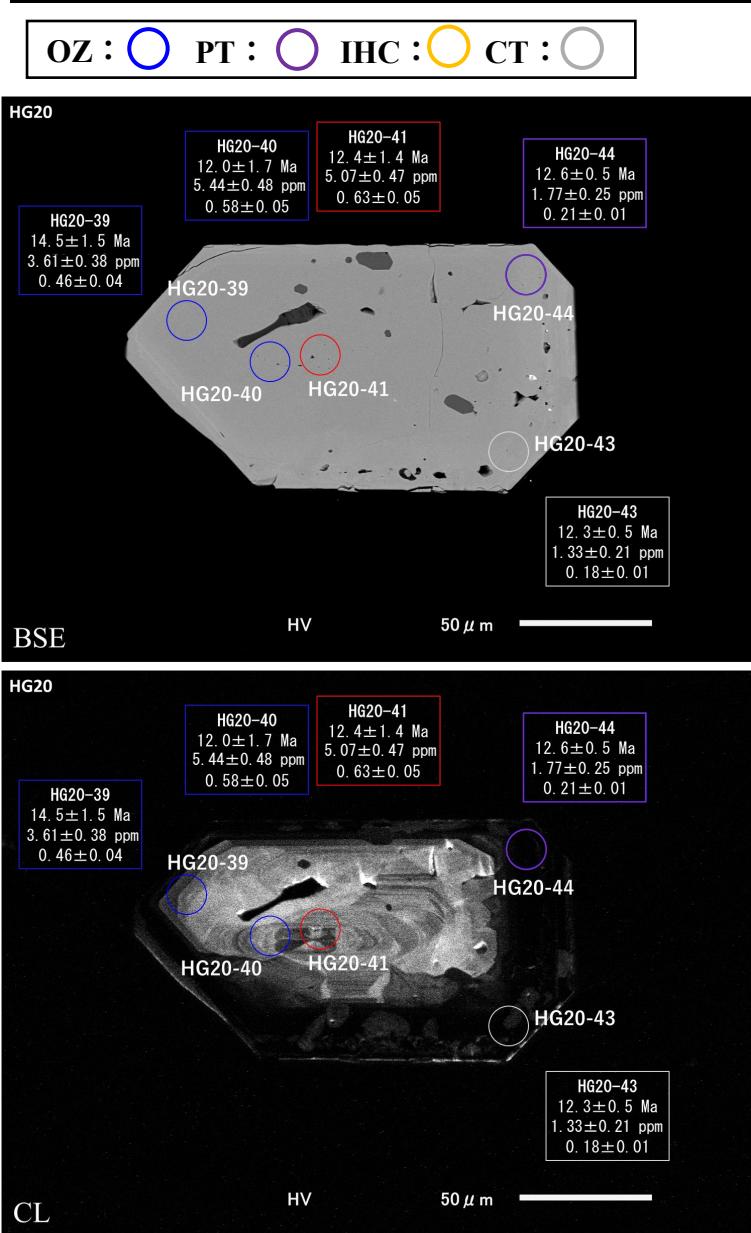
- OZ
- PT

Fig. 48 Zircon data of grain No. HG19

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio



## Morphological description

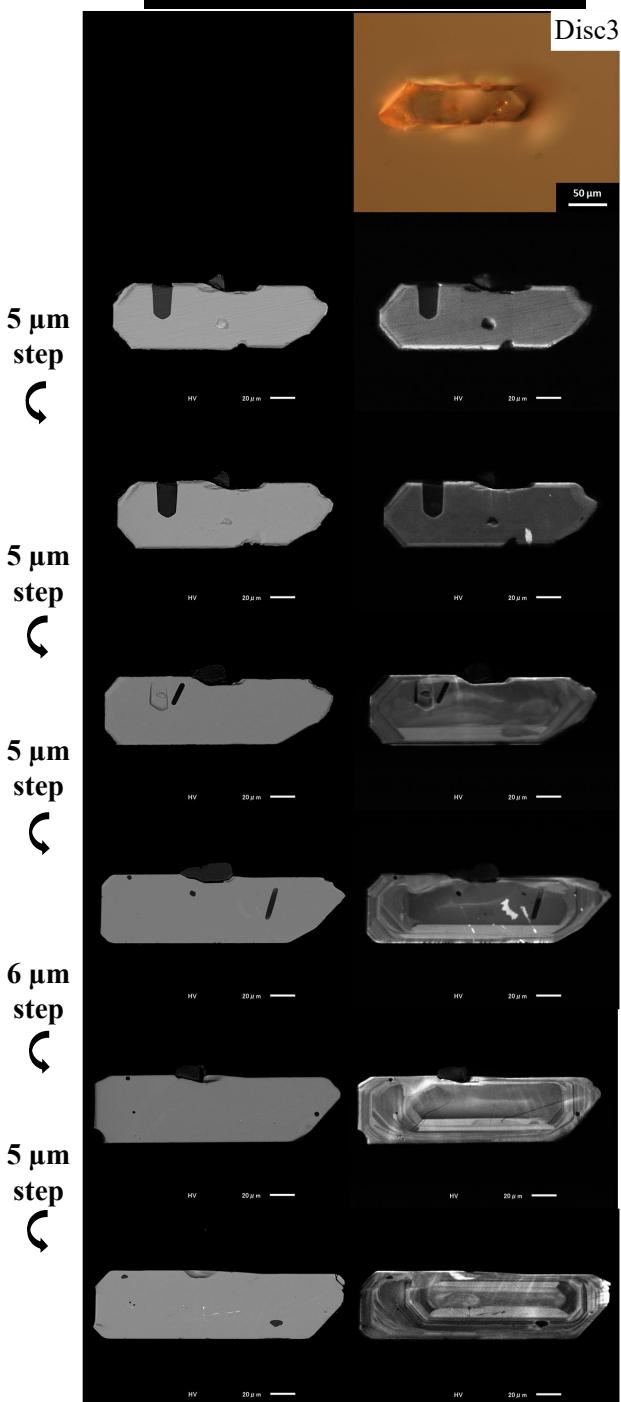
- Type {100}
- Major axis: 85 μm
- Minor axis: 173 μm
- Major axis/Minor axis: 3.2

## Observed internal texture

- OZ
- PT
- CT

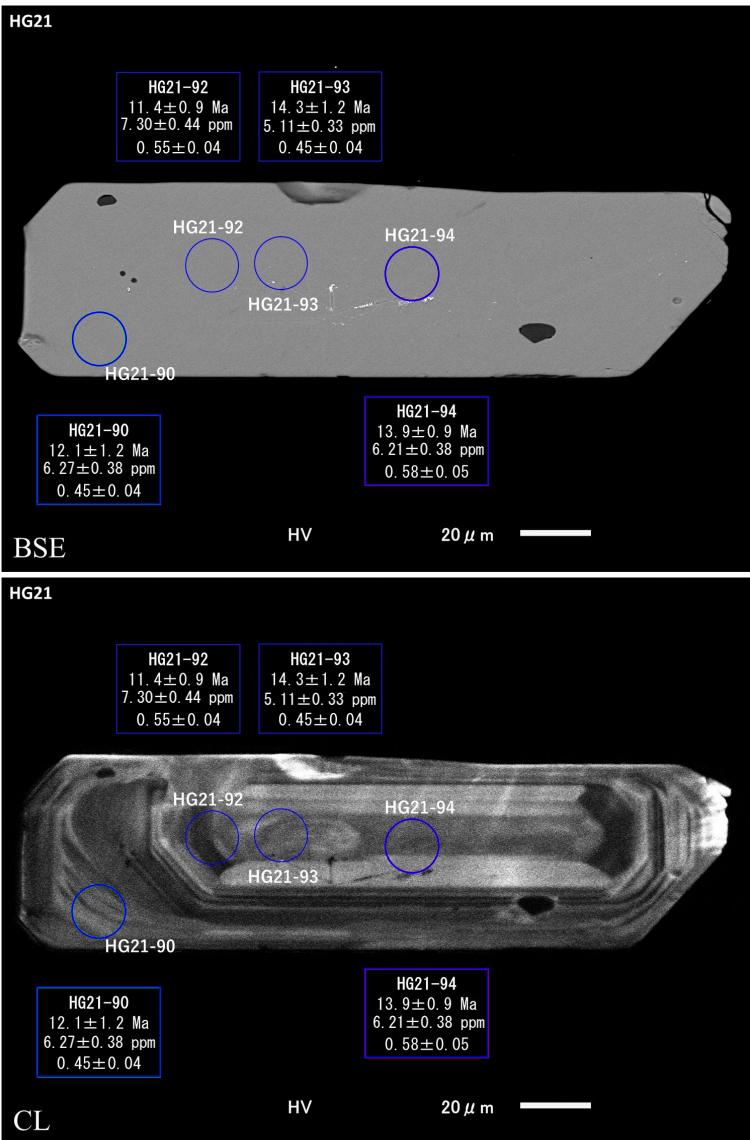
Fig. 49 Zircon data of grain No. HG20

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

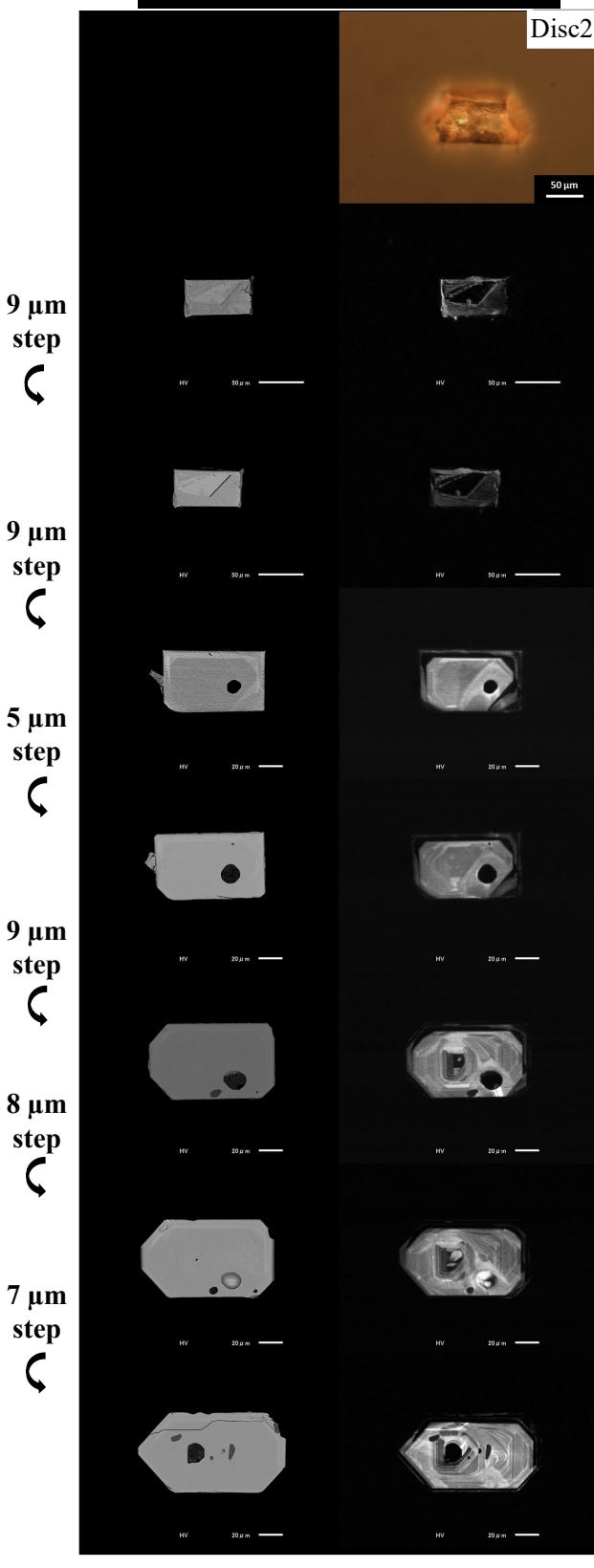
- Type {110}
- Major axis: 202 μm
- Minor axis: 62 μm
- Major axis/Minor axis: 3.2

## Observed internal texture

- OZ
- PT

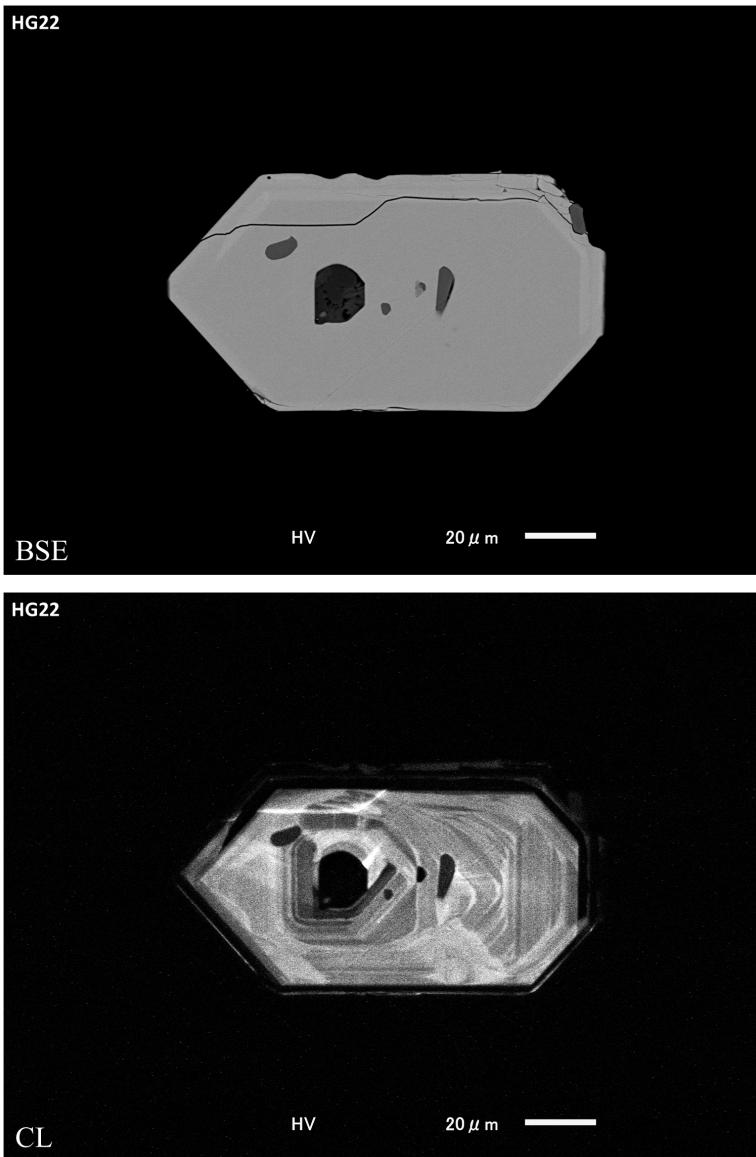
Fig. 50 Zircon data of grain No. HG21

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

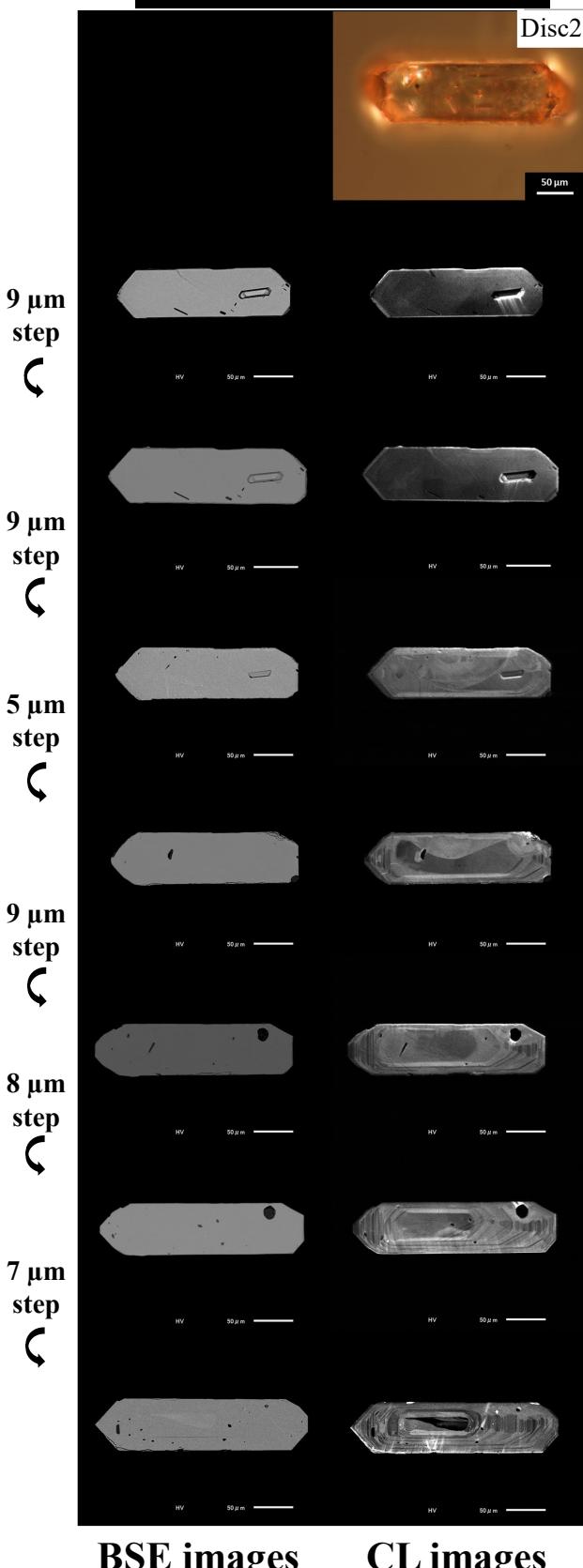
- Type {110}
- Major axis: 140  $\mu$ m
- Minor axis: 73  $\mu$ m
- Major axis/Minor axis: 1.9

**Observed internal texture**

- OZ
- PT

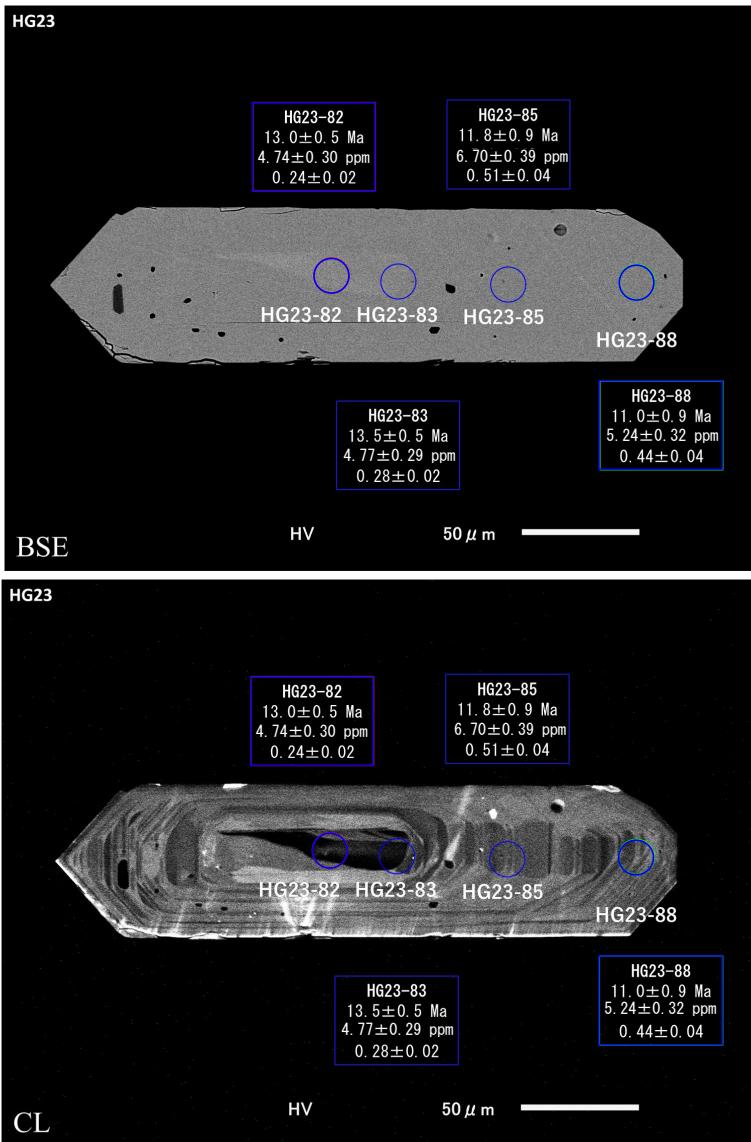
Fig. 51 Zircon data of grain No. HG22

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

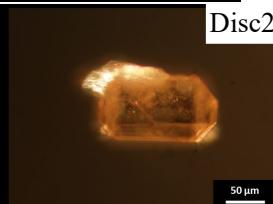
- Type {100}
- Major axis: 292 µm
- Minor axis: 85 µm
- Major axis/Minor axis: 3.5

## Observed internal texture

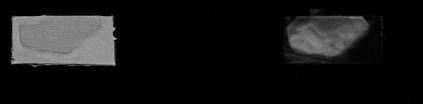
- OZ
- PT

Fig. 52 Zircon data of grain No. HG23

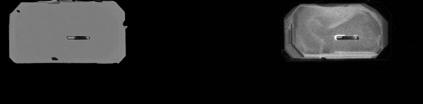
## Morphological observation and CL observation for multi-layers



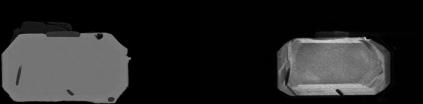
9  $\mu\text{m}$   
step



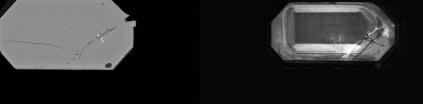
5  $\mu\text{m}$   
step



8  $\mu\text{m}$   
step



7  $\mu\text{m}$   
step



BSE images

CL images

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :

HG24

HG24-46 13.3 $\pm$ 0.9 Ma 7.28 $\pm$ 0.62 ppm 1.41 $\pm$ 0.10	HG24-47 15.2 $\pm$ 1.0 Ma 6.32 $\pm$ 0.58 ppm 1.29 $\pm$ 0.10
--	--

BSE

HG24

HG24-46 13.3 $\pm$ 0.9 Ma 7.28 $\pm$ 0.62 ppm 1.41 $\pm$ 0.10	HG24-47 15.2 $\pm$ 1.0 Ma 6.32 $\pm$ 0.58 ppm 1.29 $\pm$ 0.10
--	--

CL

## Morphological description

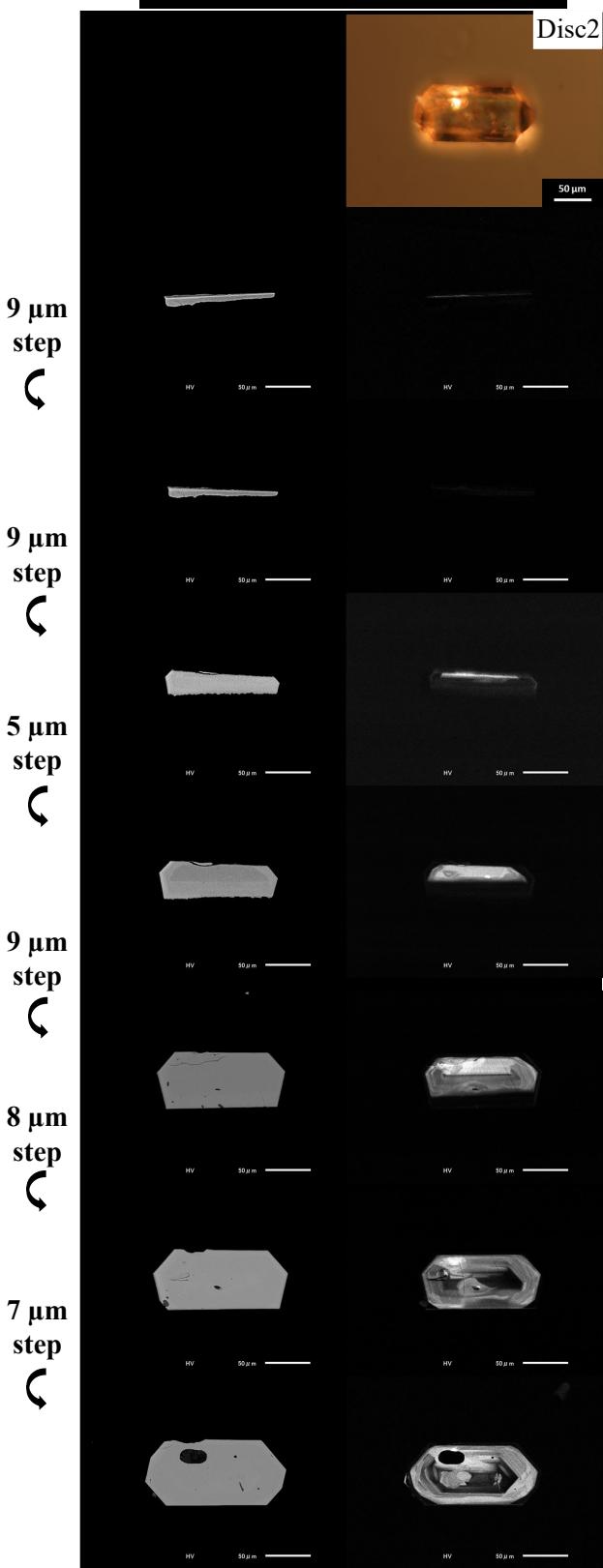
- Type {100}
- Major axis: 154  $\mu\text{m}$
- Minor axis: 72  $\mu\text{m}$
- Major axis/Minor axis: 2.1

## Observed internal texture

- OZ

Fig. 53 Zircon data of grain No. HG24

**Morphological observation and CL observation for multi-layers**

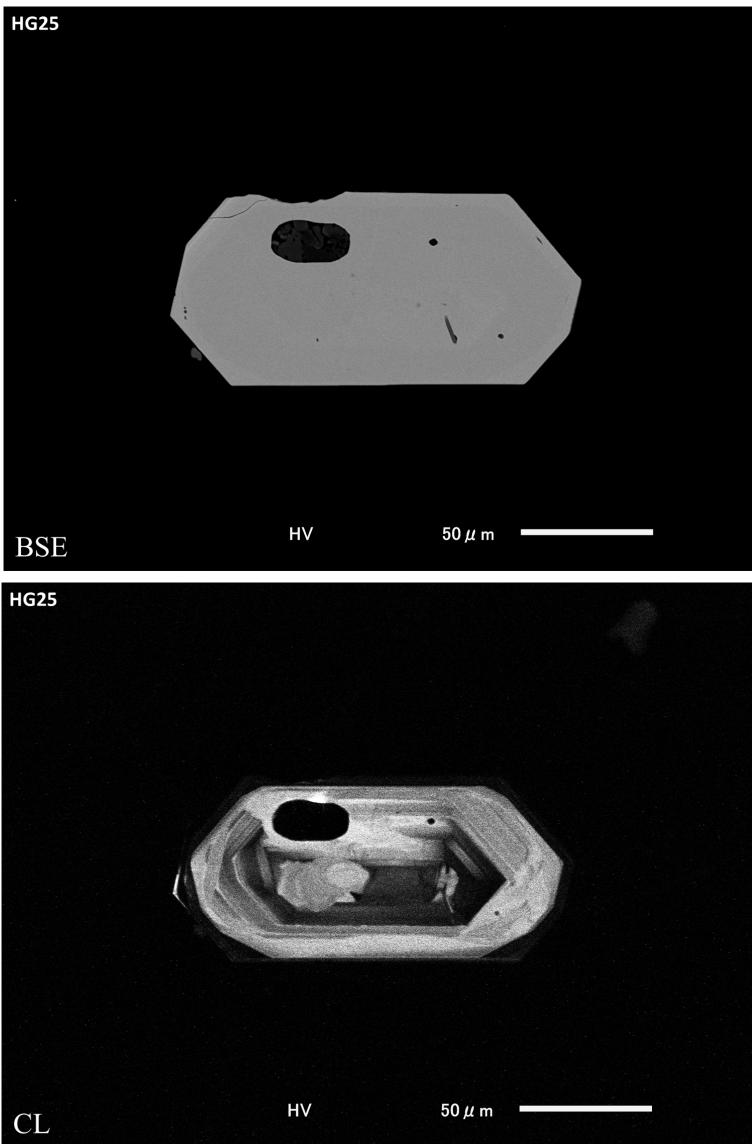


**BSE images**

**CL images**

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

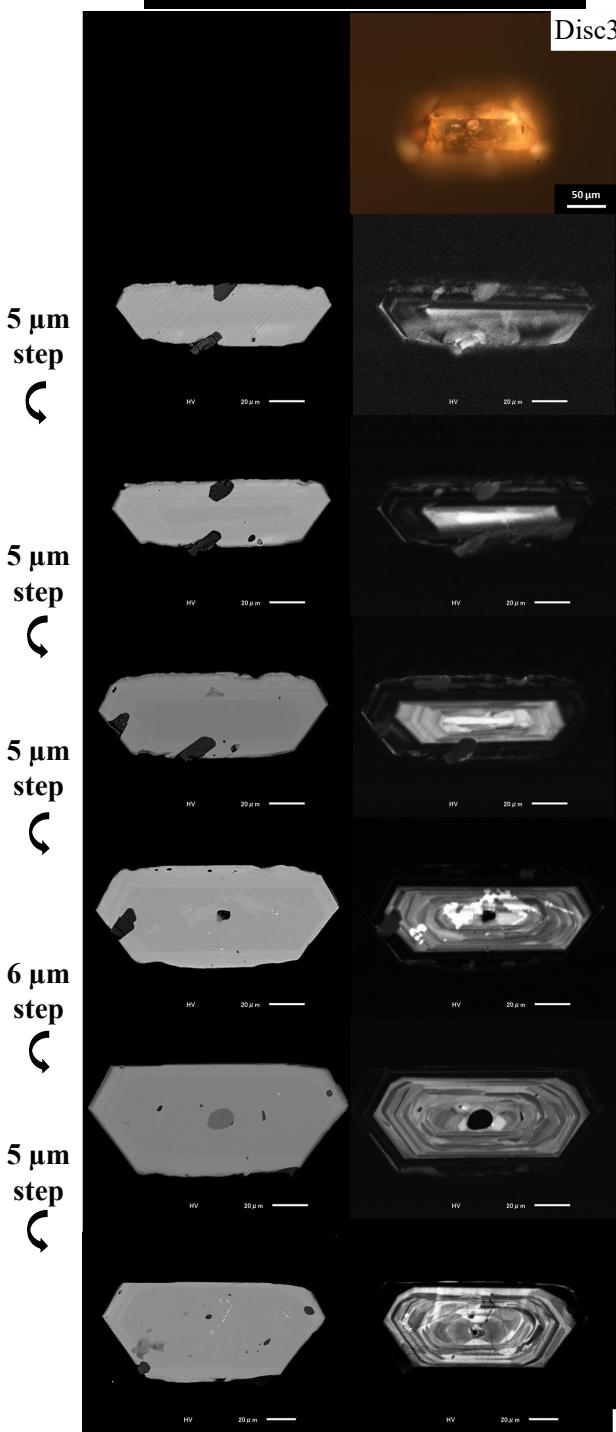
- Type {100}
- Major axis: 161  $\mu\text{m}$
- Minor axis: 78  $\mu\text{m}$
- Major axis/Minor axis: 2.1

**Observed internal texture**

- OZ
- PT

Fig. 54 Zircon data of grain No. HG25

**Morphological observation and CL observation for multi-layers**



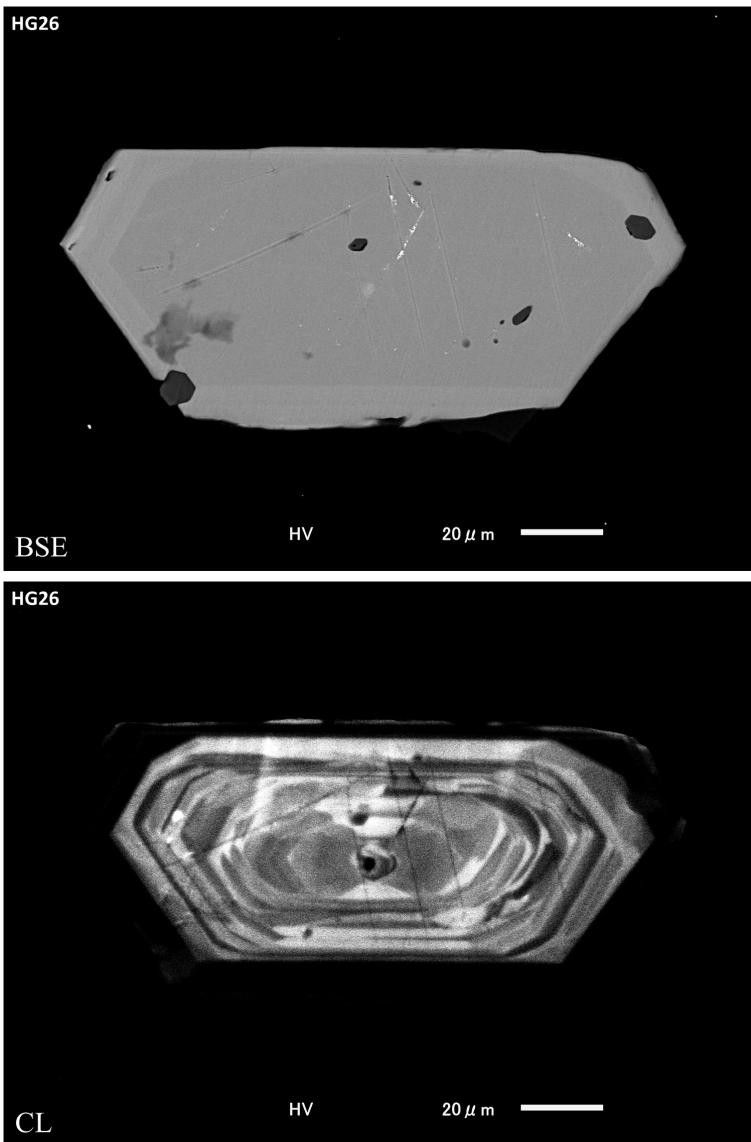
BSE images

CL images

<Legend>  
 OZ: Oscillatory zoning  
 PT: Porous texture  
 CT: Chaotic texture  
 LDT: Local disturbance texture  
 IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

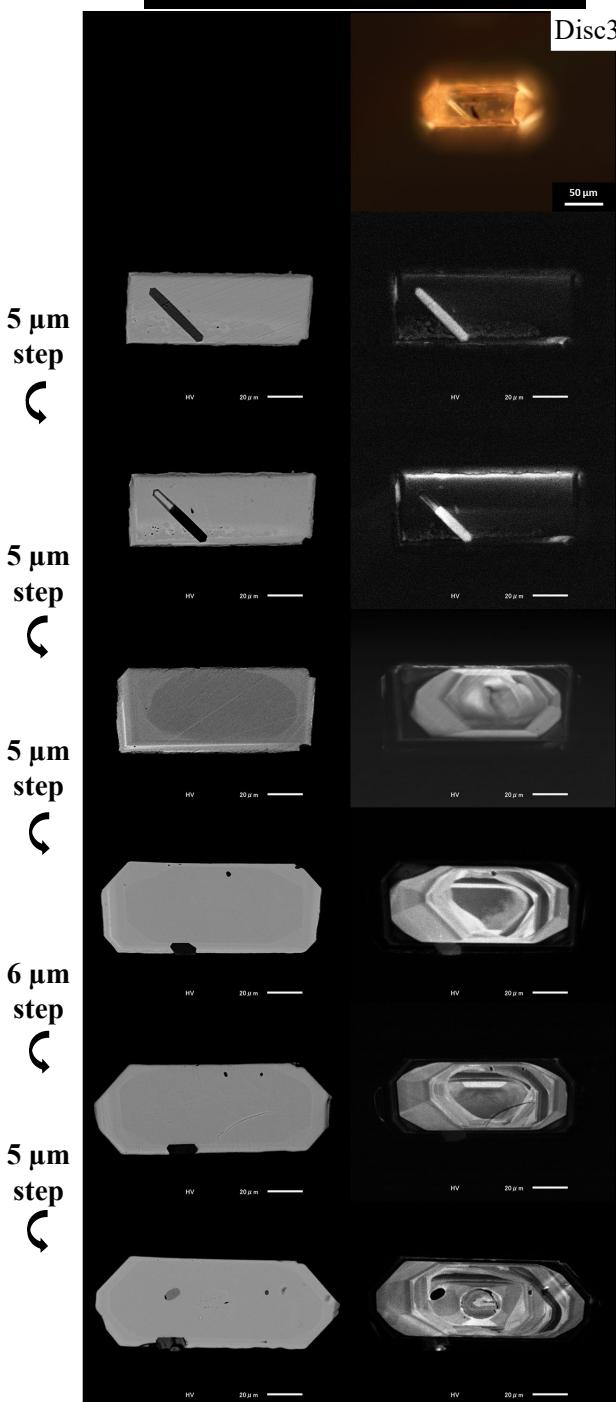
- Type {100}
- Major axis: 160  $\mu\text{m}$
- Minor axis: 60  $\mu\text{m}$
- Major axis/Minor axis: 2.7

**Observed internal texture**

- |      |       |
|------|-------|
| • OZ | • IHC |
| • PT | • CT  |

Fig. 55 Zircon data of grain No. HG26

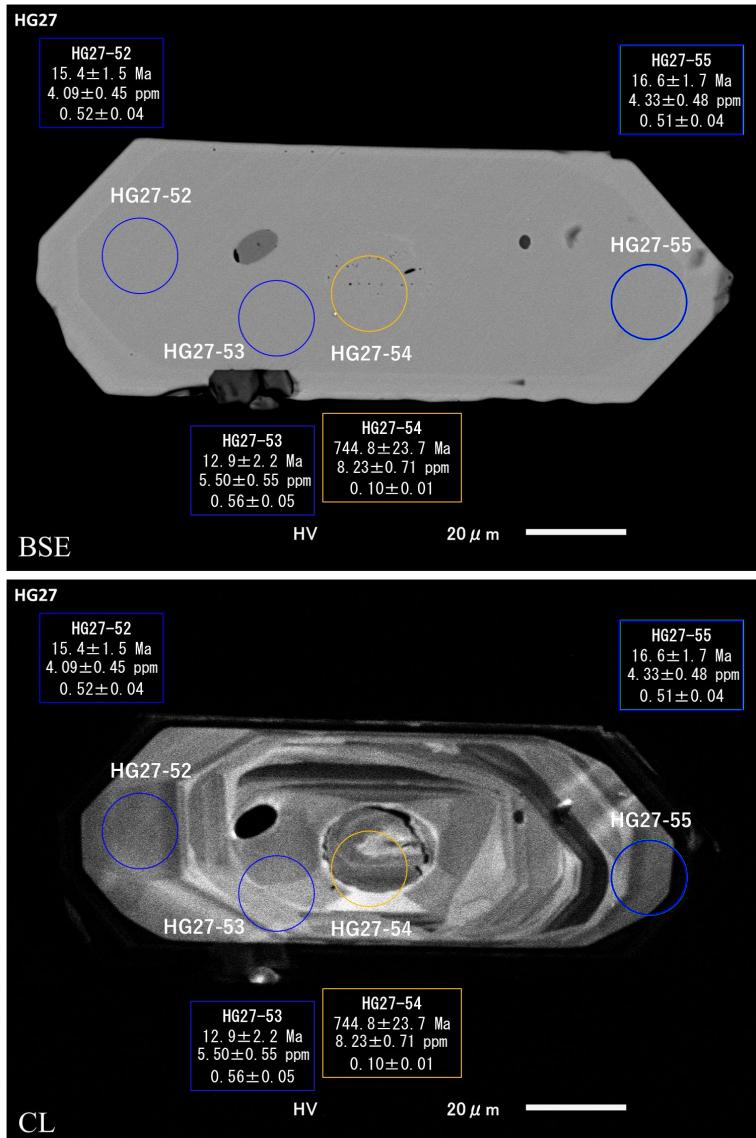
## Morphological observation and CL observation for multi-layers



<Legend>  
 OZ: Oscillatory zoning  
 PT: Porous texture  
 CT: Chaotic texture  
 LDT: Local disturbance texture  
 IHC: Inherited core

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

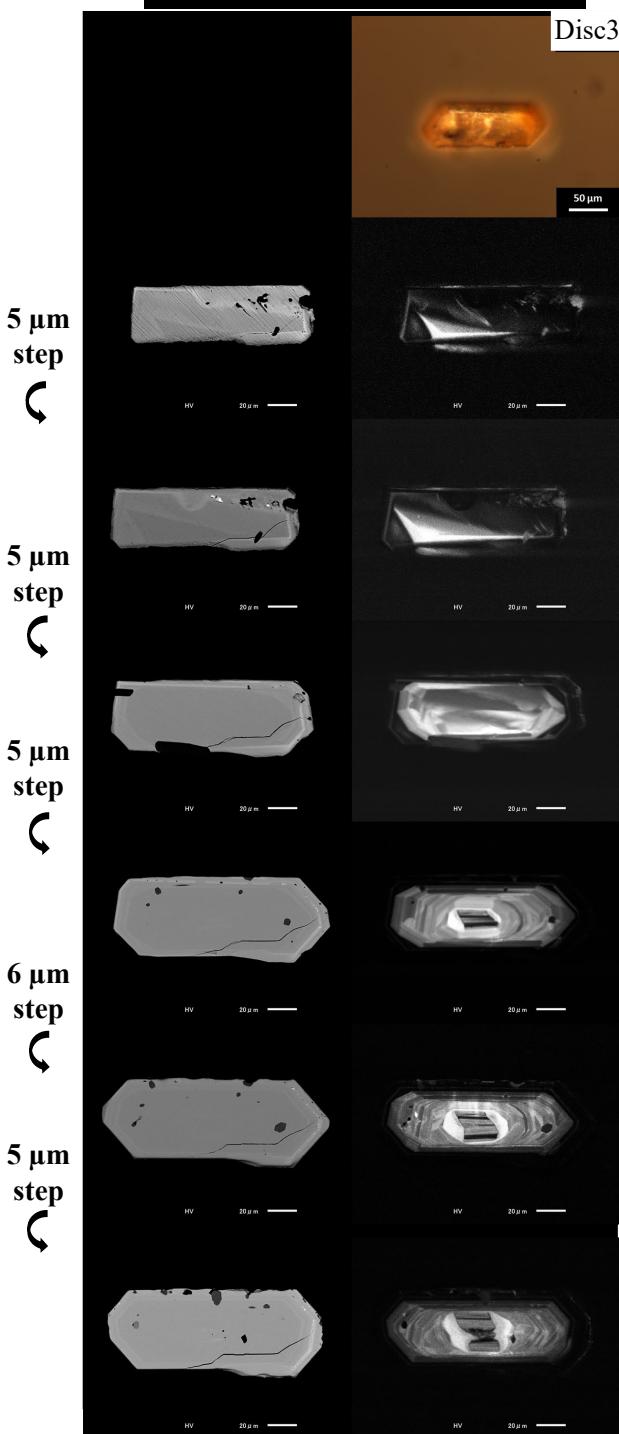
- Type {100}
- Major axis: 141 μm
- Minor axis: 54 μm
- Major axis/Minor axis: 2.6

## Observed internal texture

- OZ
- IHC

Fig. 56 Zircon data of grain No. HG27

## Morphological observation and CL observation for multi-layers



<Legend>

OZ: Oscillatory zoning

PT: Porous texture

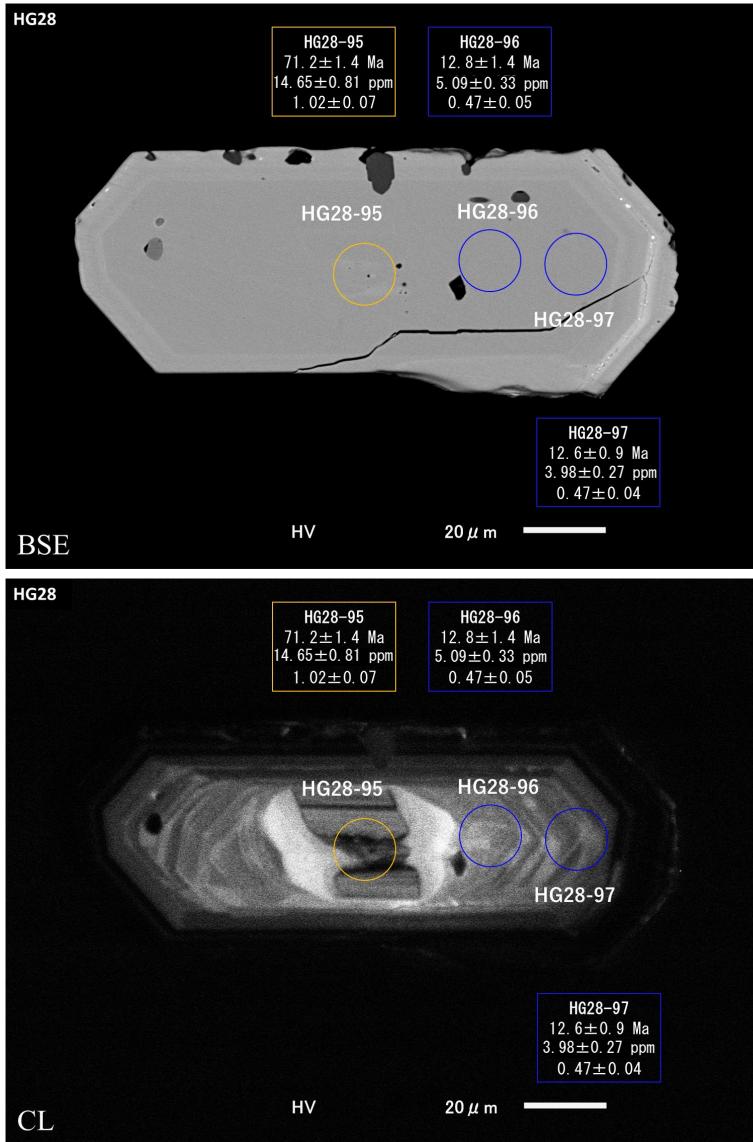
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

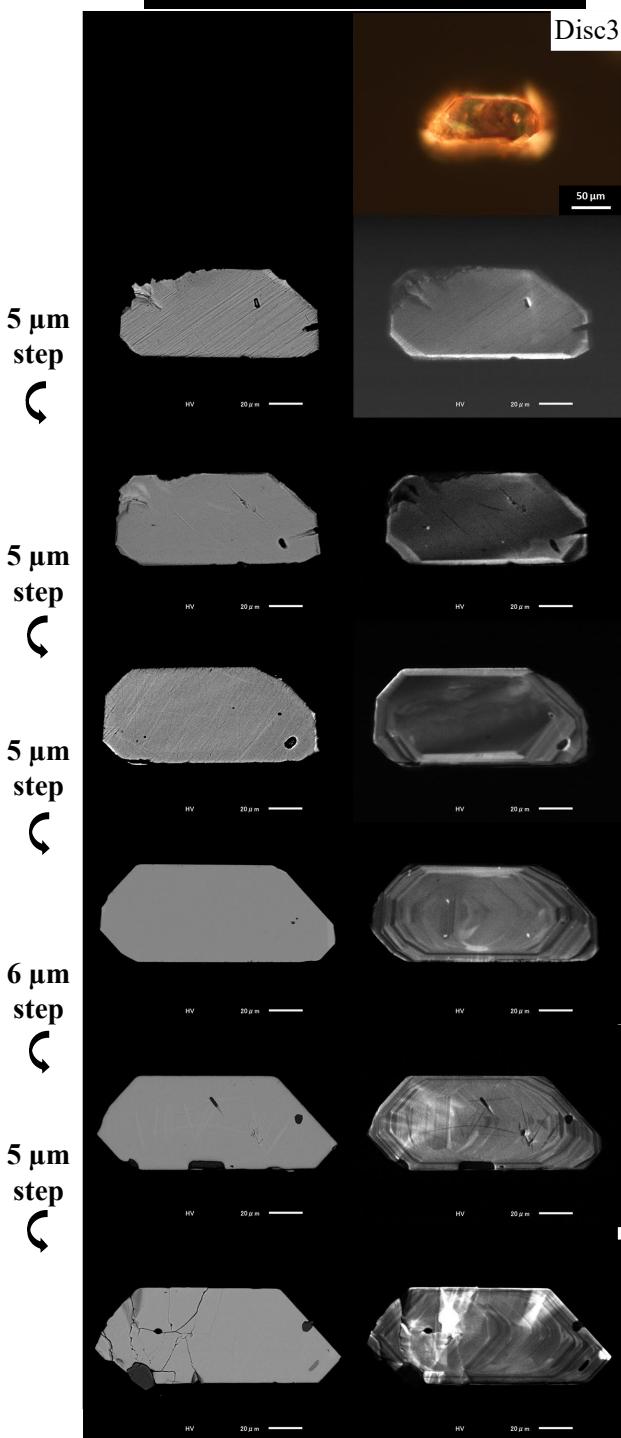
- Type {110}
- Major axis: 152  $\mu m$
- Minor axis: 57  $\mu m$
- Major axis/Minor axis: 2.6

## Observed internal texture

- OZ
- PT
- IHC

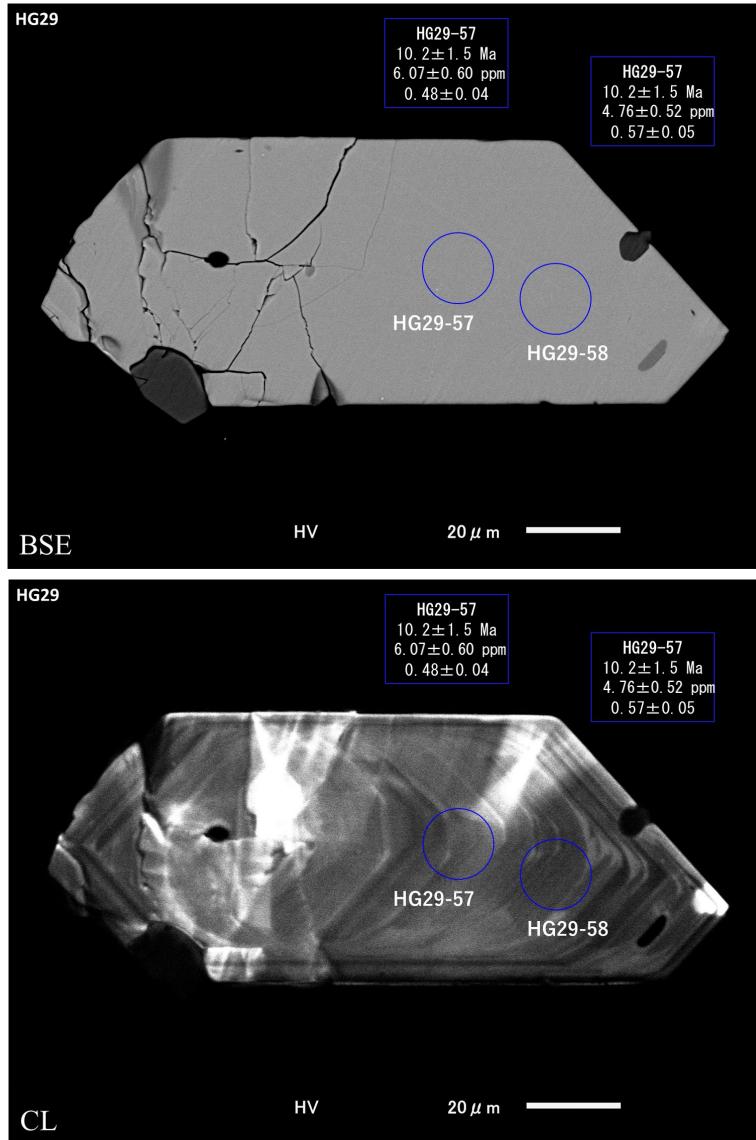
Fig. 57 Zircon data of grain No. HG28

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

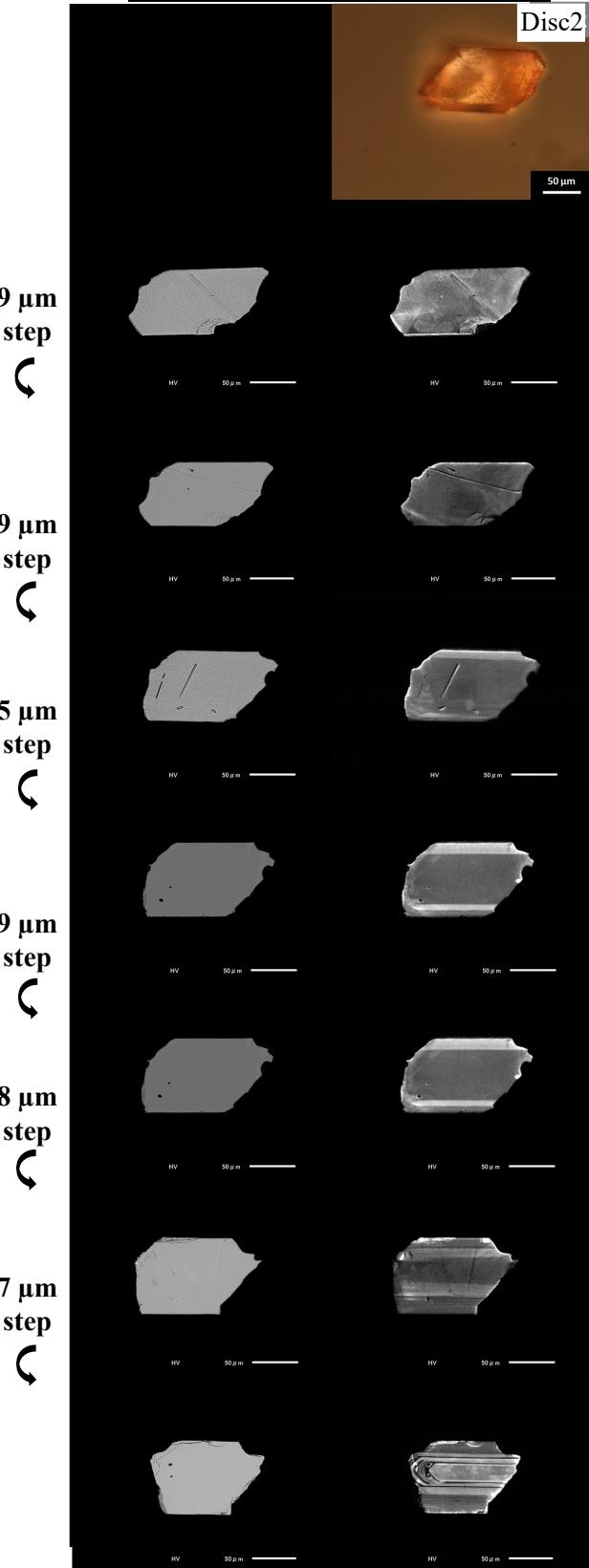
- Type {110}
- Major axis:  $148 \mu\text{m}$
- Minor axis:  $61 \mu\text{m}$
- Major axis/Minor axis: 2.4

## Observed internal texture

- OZ

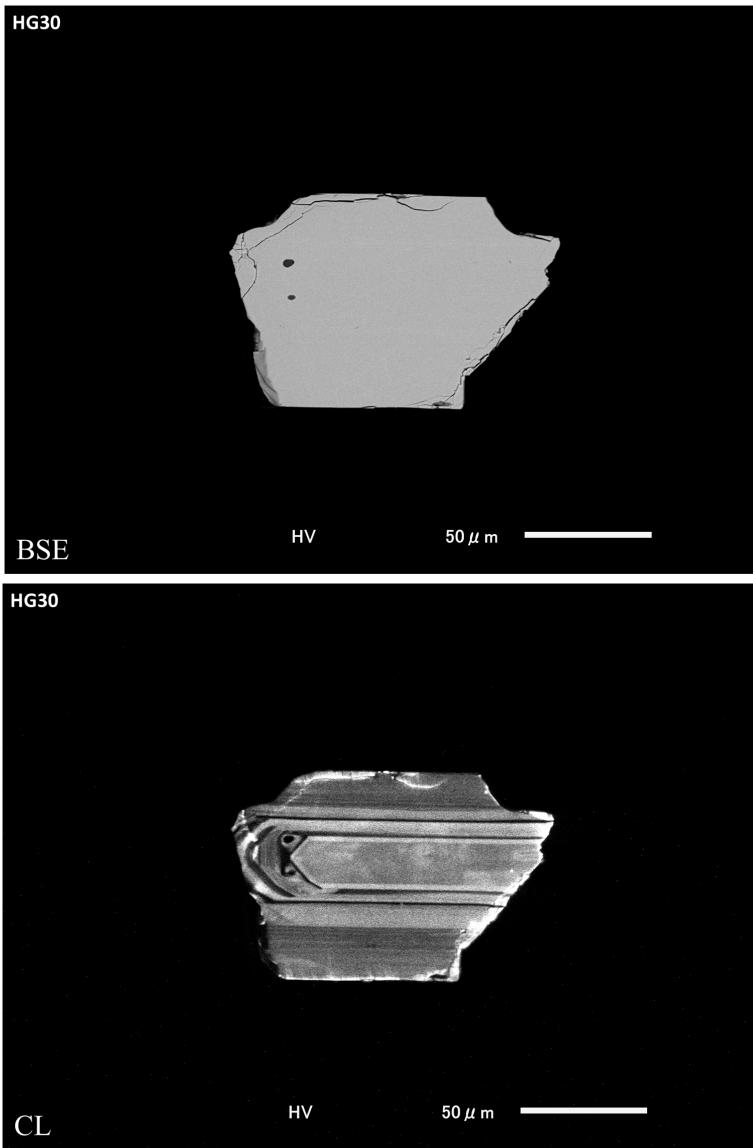
Fig. 58 Zircon data of grain No. HG29

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

- Type –not classified
- Major axis: 167  $\mu$ m
- Minor axis: 84  $\mu$ m
- Major axis/Minor axis: 2.0

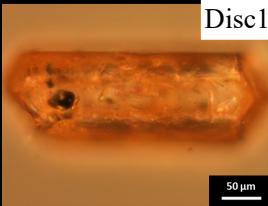
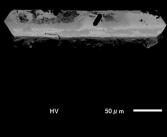
**Observed internal texture**

- OZ

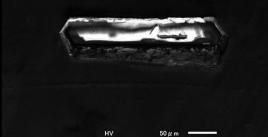
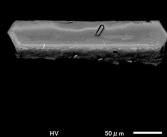
Fig. 59 Zircon data of grain No. HG30

## Morphological observation and CL observation for multi-layers

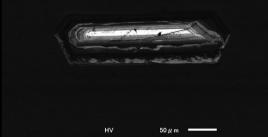
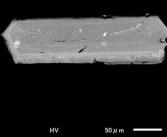
6  $\mu\text{m}$   
step



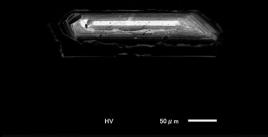
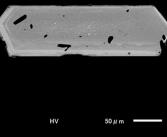
8  $\mu\text{m}$   
step



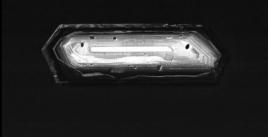
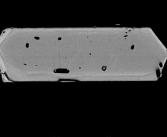
8  $\mu\text{m}$   
step



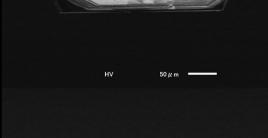
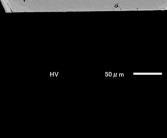
7  $\mu\text{m}$   
step



5  $\mu\text{m}$   
step



5  $\mu\text{m}$   
step



BSE images

CL images

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :

HGD1

HGD1-57  
13.0±0.4 Ma  
1.99±0.16 ppm  
0.40±0.03

HGD1-61  
11.3±0.9 Ma  
6.00±0.38 ppm  
0.61±0.05

HGD1-63  
11.7±0.6 Ma  
6.31±0.39 ppm  
0.89±0.07

HGD1-65  
13.3±1.3 Ma  
6.85±0.41 ppm  
0.57±0.05

HGD1-57

HGD1-62  
10.2±0.6 Ma  
6.07±0.38 ppm  
0.82±0.06

HGD1-64  
12.8±0.8 Ma  
5.88±0.36 ppm  
0.88±0.07

HGD1-69  
14.2±0.7 Ma  
3.31±0.24 ppm  
0.42±0.03

BSE

HV

50  $\mu\text{m}$

HGD1

HGD1-57  
13.0±0.4 Ma  
1.99±0.16 ppm  
0.40±0.03

HGD1-61  
11.3±0.9 Ma  
6.00±0.38 ppm  
0.61±0.05

HGD1-63  
11.7±0.6 Ma  
6.31±0.39 ppm  
0.89±0.07

HGD1-65  
13.3±1.3 Ma  
6.85±0.41 ppm  
0.57±0.05

HGD1-69  
14.2±0.7 Ma  
3.31±0.24 ppm  
0.42±0.03

HGD1-57

HGD1-62  
10.2±0.6 Ma  
6.07±0.38 ppm  
0.82±0.06

HGD1-64  
12.8±0.8 Ma  
5.88±0.36 ppm  
0.88±0.07

HGD1-69  
14.2±0.7 Ma  
3.31±0.24 ppm  
0.42±0.03

CL

HV

50  $\mu\text{m}$

## Morphological description

- Type {110}
- Major axis: 327  $\mu\text{m}$
- Minor axis: 110  $\mu\text{m}$
- Major axis/Minor axis: 3.0

## Observed internal texture

- OZ
- PT
- CT

Fig. 60 Zircon data of grain No. HGD1

## Morphological observation and CL observation for multi-layers

6  $\mu\text{m}$   
step

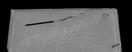


HV 50  $\mu\text{m}$



HV 50  $\mu\text{m}$

8  $\mu\text{m}$   
step

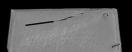


HV 50  $\mu\text{m}$



HV 50  $\mu\text{m}$

8  $\mu\text{m}$   
step

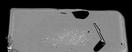


HV 50  $\mu\text{m}$

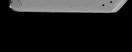


HV 50  $\mu\text{m}$

7  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$



HV 50  $\mu\text{m}$

5  $\mu\text{m}$   
step

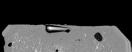


HV 50  $\mu\text{m}$



HV 50  $\mu\text{m}$

5  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$



HV 50  $\mu\text{m}$

BSE images

CL images

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :

HGD2

HGD2-1  
 $12.3 \pm 1.0 \text{ Ma}$   
 $3.60 \pm 0.38 \text{ ppm}$   
 $0.57 \pm 0.04$

HGD2-2  
 $12.5 \pm 1.1 \text{ Ma}$   
 $5.06 \pm 0.47 \text{ ppm}$   
 $0.51 \pm 0.04$

HGD2-5  
 $14.0 \pm 0.5 \text{ Ma}$   
 $1.81 \pm 0.24 \text{ ppm}$   
 $0.41 \pm 0.03$

BSE

HV 50  $\mu\text{m}$

HGD2

HGD2-1  
 $12.3 \pm 1.0 \text{ Ma}$   
 $3.60 \pm 0.38 \text{ ppm}$   
 $0.57 \pm 0.04$

HGD2-2  
 $12.5 \pm 1.1 \text{ Ma}$   
 $5.06 \pm 0.47 \text{ ppm}$   
 $0.51 \pm 0.04$

HGD2-5  
 $14.0 \pm 0.5 \text{ Ma}$   
 $1.81 \pm 0.24 \text{ ppm}$   
 $0.41 \pm 0.03$

CL

HV 50  $\mu\text{m}$

## Morphological description

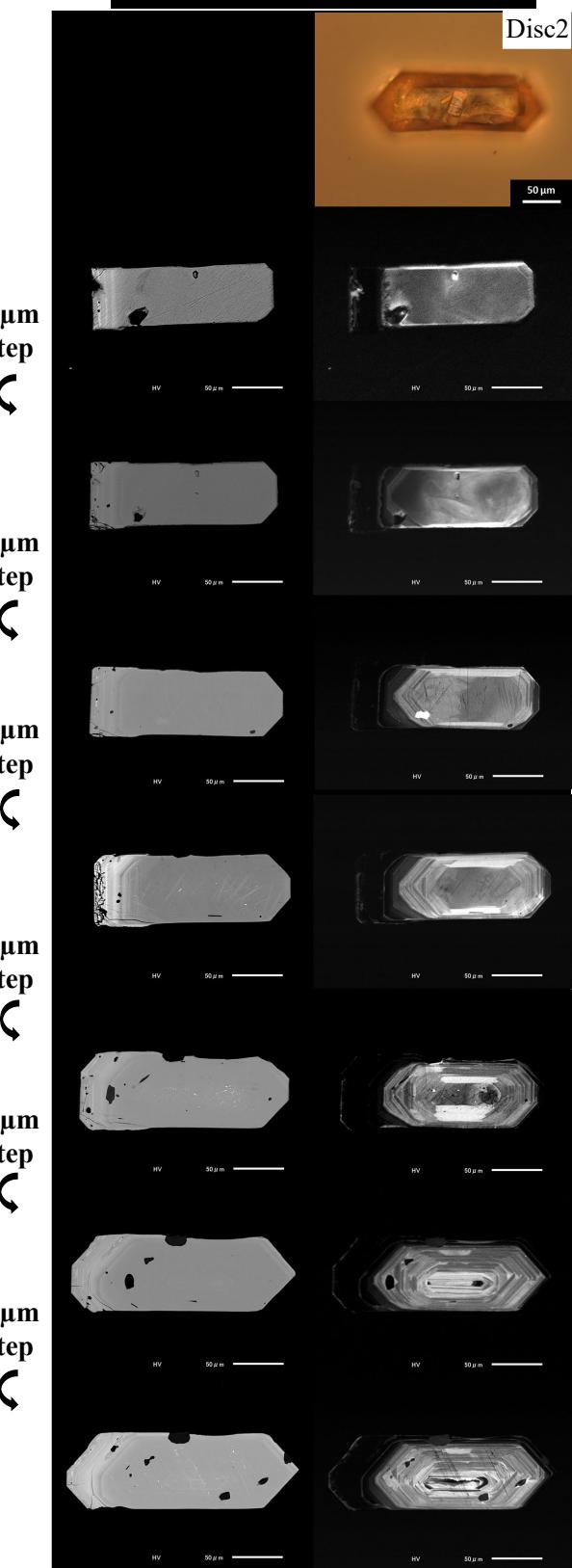
- Type {100}
- Major axis: 254  $\mu\text{m}$
- Minor axis: 98  $\mu\text{m}$
- Major axis/Minor axis: 2.6

## Observed internal texture

- OZ
- PT

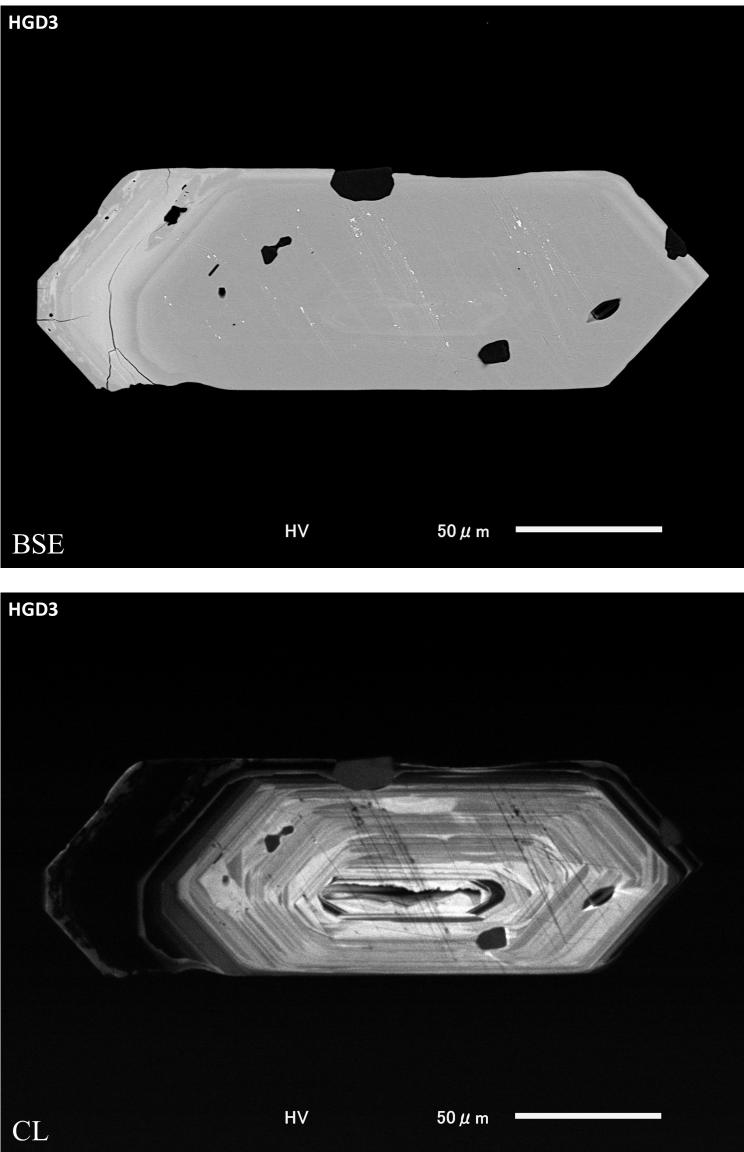
Fig. 61 Zircon data of grain No. HGD2

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

- Type {100}
- Major axis: 226  $\mu\text{m}$
- Minor axis: 81  $\mu\text{m}$
- Major axis/Minor axis: 2.8

**Observed internal texture**

- OZ
- PT
- CT

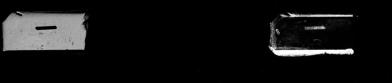
**BSE images**

**CL images**

Fig. 62 Zircon data of grain No. HGD3

**Morphological observation and CL observation for multi-layers**

6  $\mu\text{m}$   
step



Disc1

50  $\mu\text{m}$



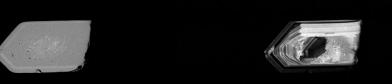
HV 50  $\mu\text{m}$



HV 50  $\mu\text{m}$



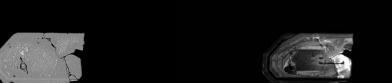
HV 50  $\mu\text{m}$



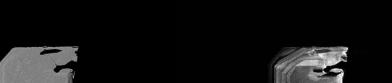
HV 50  $\mu\text{m}$



HV 50  $\mu\text{m}$



HV 50  $\mu\text{m}$



HV 100  $\mu\text{m}$

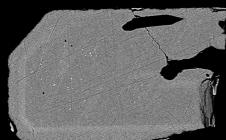
**BSE images**

**CL images**

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :

HGD4

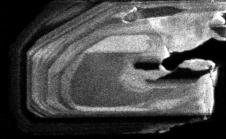


BSE

HV

100  $\mu\text{m}$

HGD4



CL

HV

100  $\mu\text{m}$

**Morphological description**

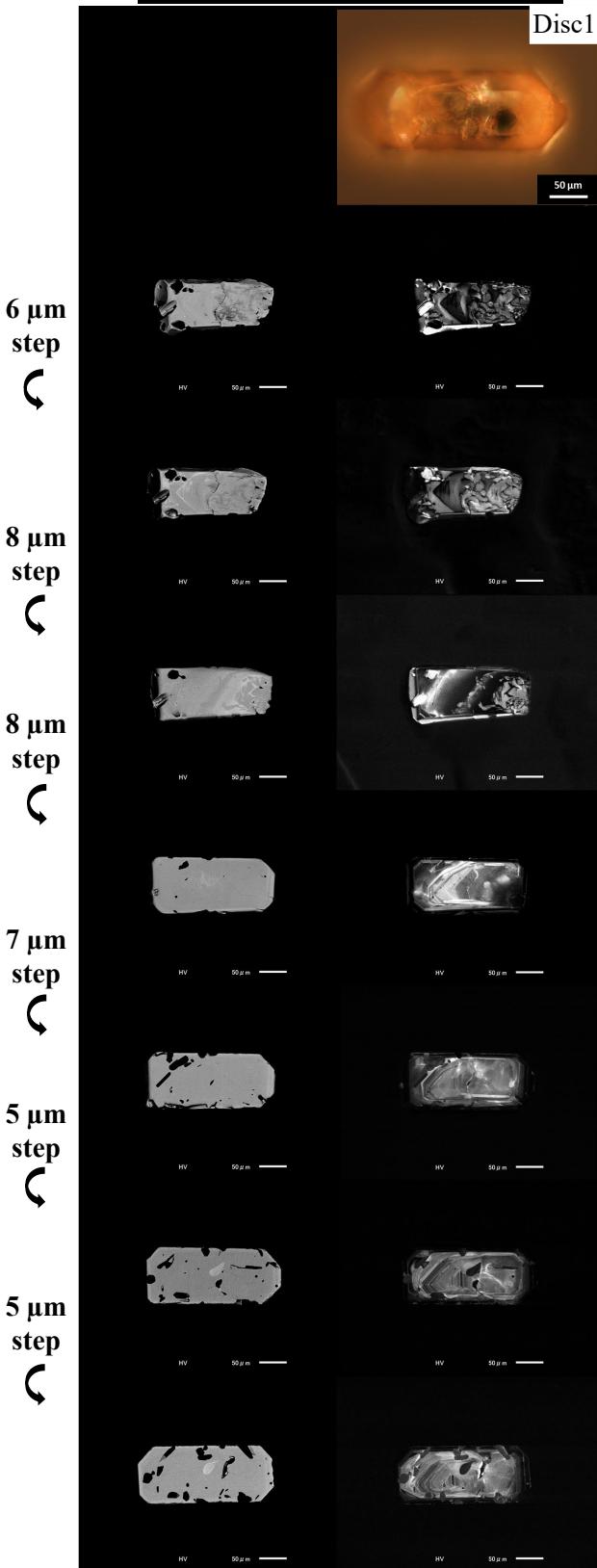
- Type {100}
- Major axis: 178  $\mu\text{m}$
- Minor axis: 91  $\mu\text{m}$
- Major axis/Minor axis: 2.0

**Observed internal texture**

- OZ
- PT

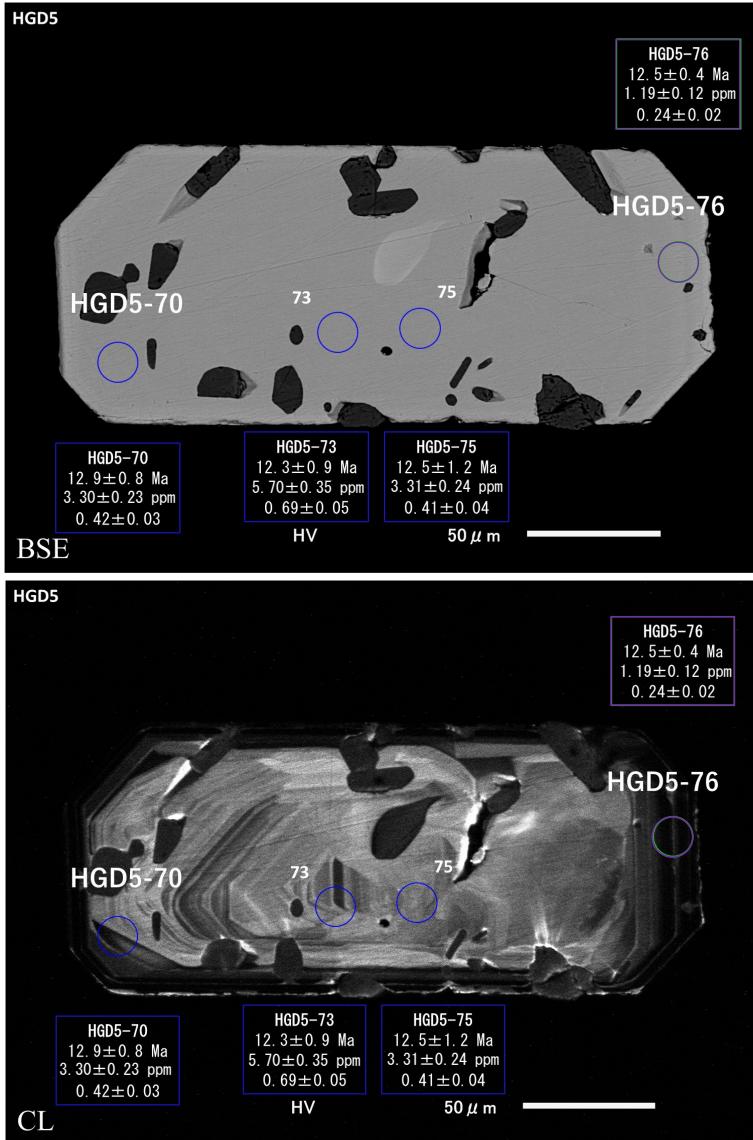
Fig. 63 Zircon data of grain No. HGD4

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

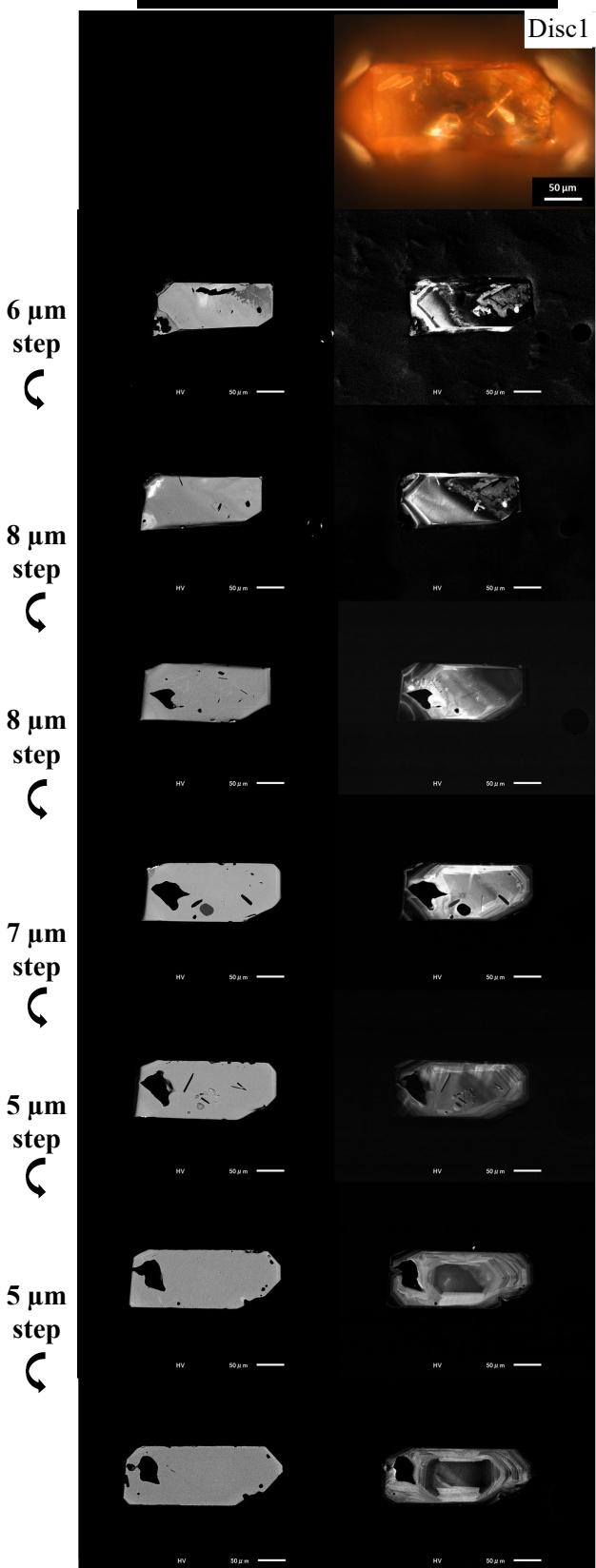
- Type {100}
- Major axis: 265 μm
- Minor axis: 101 μm
- Major axis/Minor axis: 2.6

## Observed internal texture

- OZ
- PT
- CT

Fig. 64 Zircon data of grain No. HGD5

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :

HGD6

BSE

HV

50  $\mu\text{m}$

HGD6

HV

50  $\mu\text{m}$

**BSE images**

**CL images**

**Morphological description**

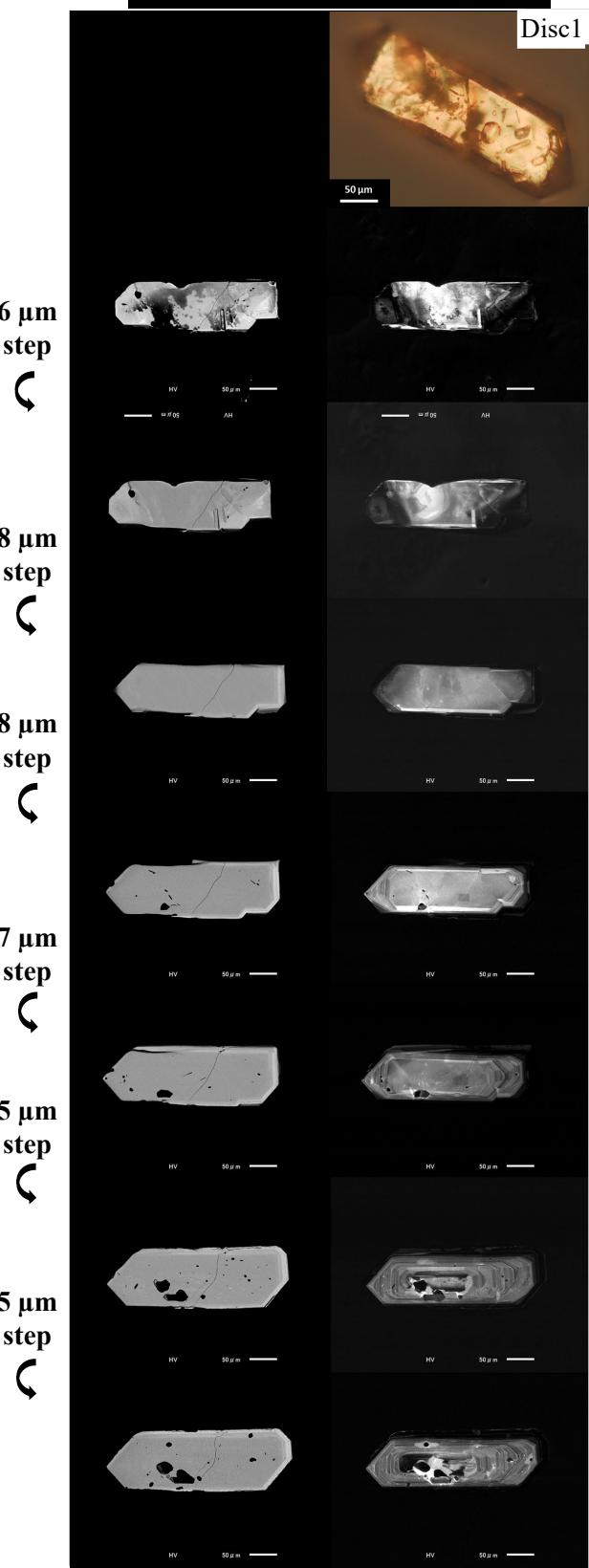
- Type {100}
- Major axis: 301  $\mu\text{m}$
- Minor axis: 116  $\mu\text{m}$
- Major axis/Minor axis: 2.6

**Observed internal texture**

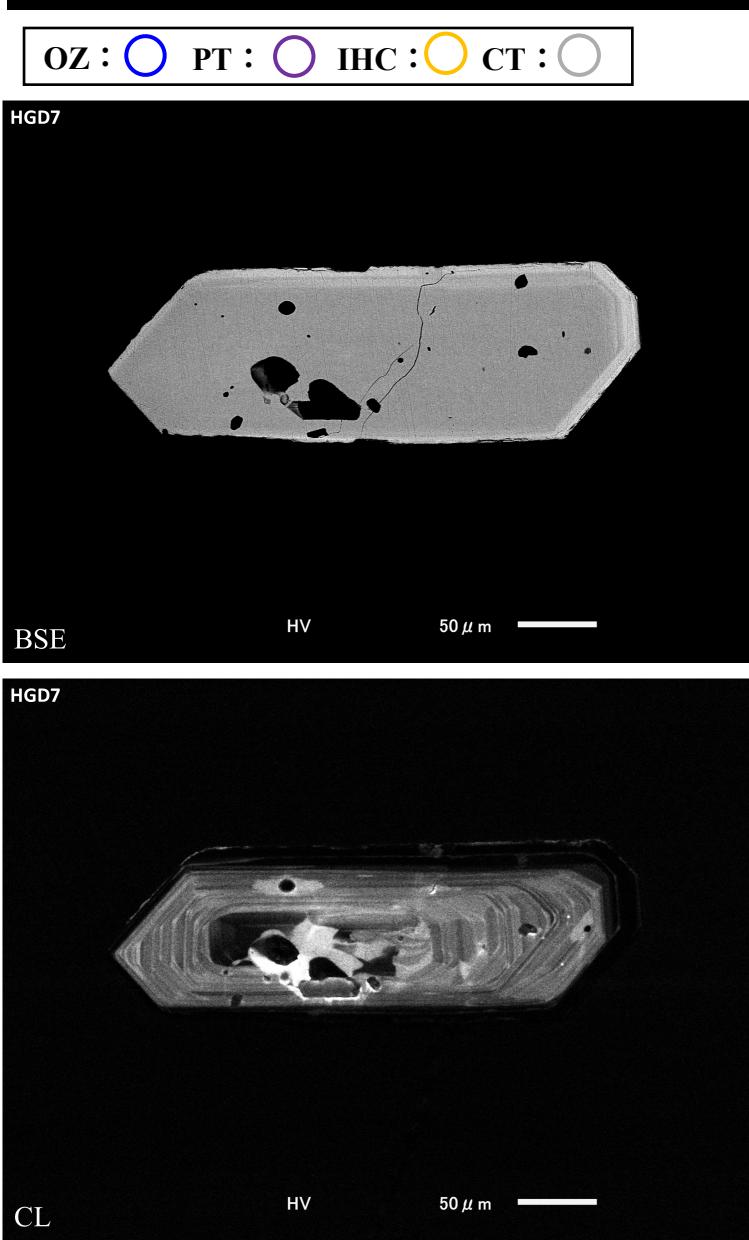
- OZ
- CT

Fig. 65 Zircon data of grain No. HGD6

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**



**Morphological description**

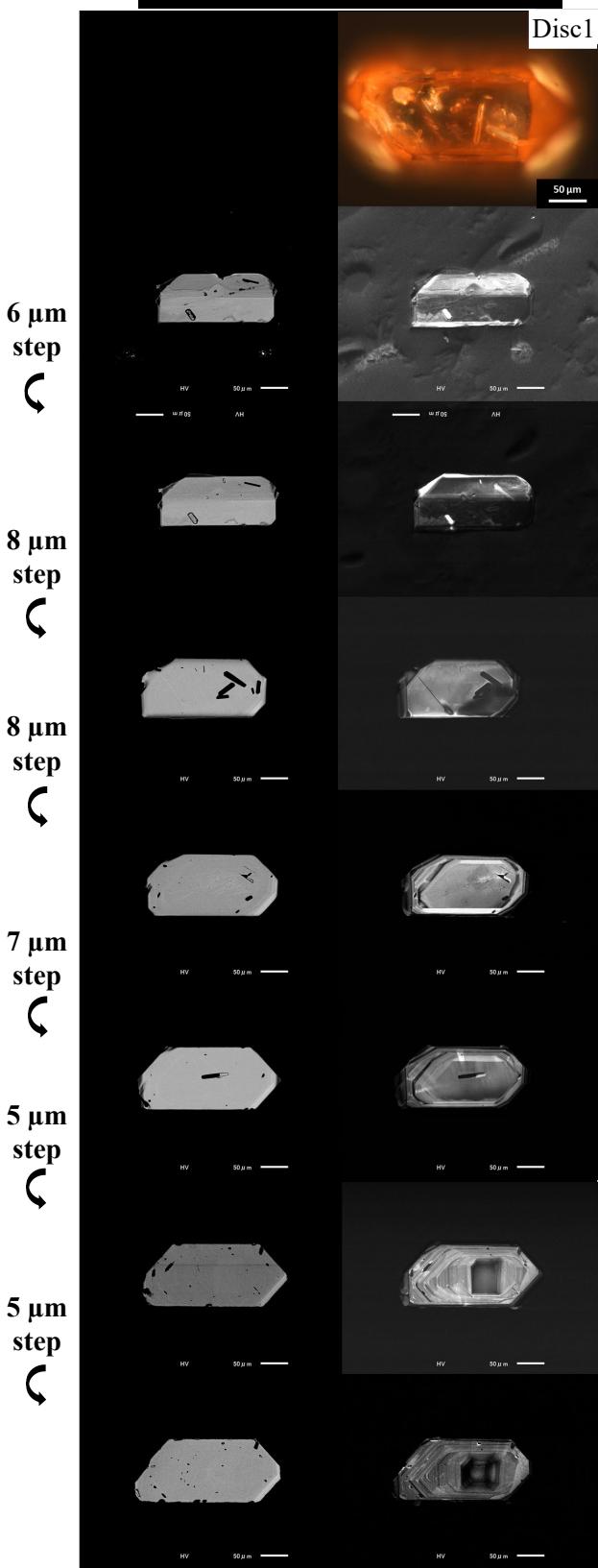
- Type {100}
- Major axis: 333  $\mu\text{m}$
- Minor axis: 111  $\mu\text{m}$
- Major axis/Minor axis: 3.0

**Observed internal texture**

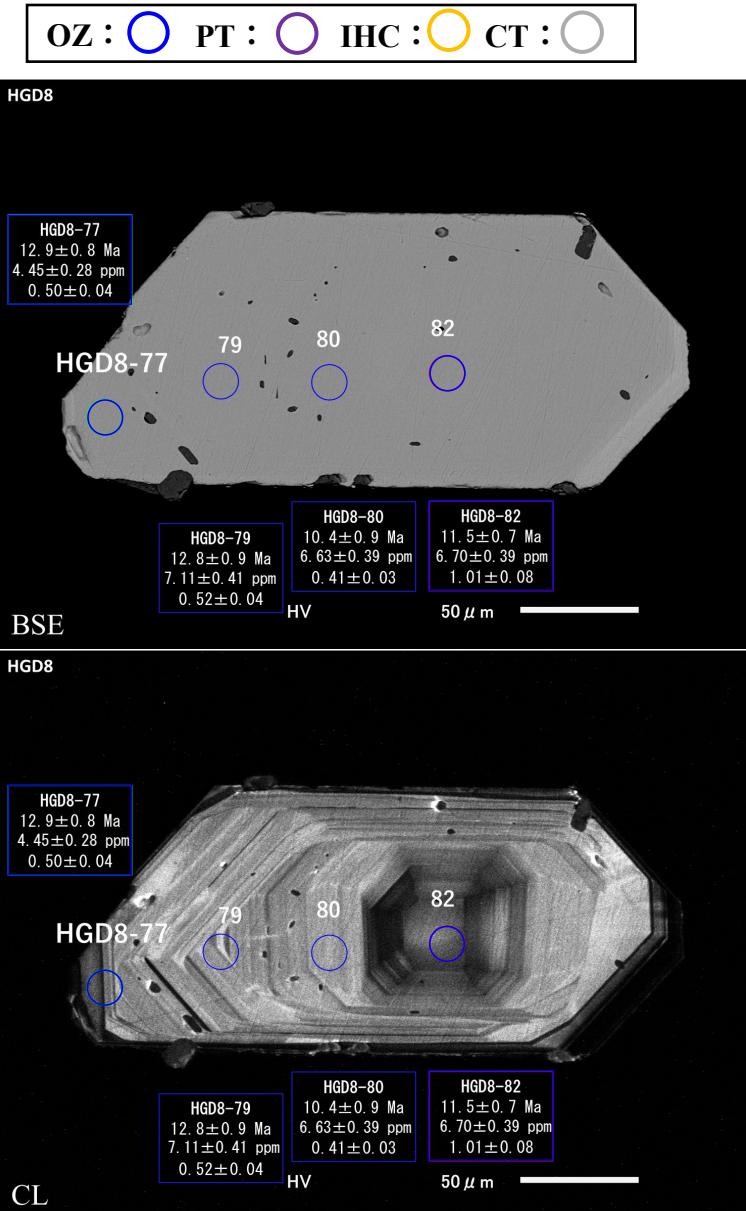
- OZ
- PT
- CT

Fig. 66 Zircon data of grain No. HGD7

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio



## Morphological description

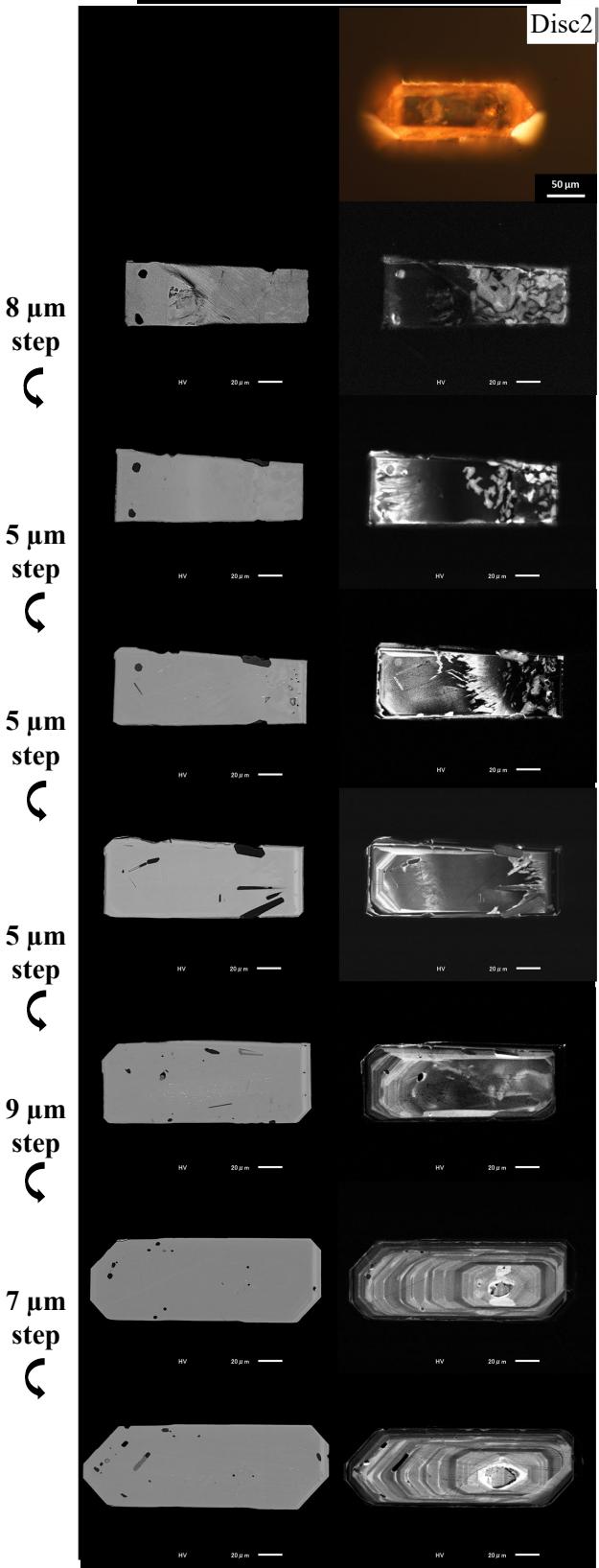
- Type {100}
- Major axis: 267  $\mu\text{m}$
- Minor axis: 115  $\mu\text{m}$
- Major axis/Minor axis: 2.3

## Observed internal texture

- OZ
- PT

Fig. 67 Zircon data of grain No. HGD8

**Morphological observation and CL observation for multi-layers**

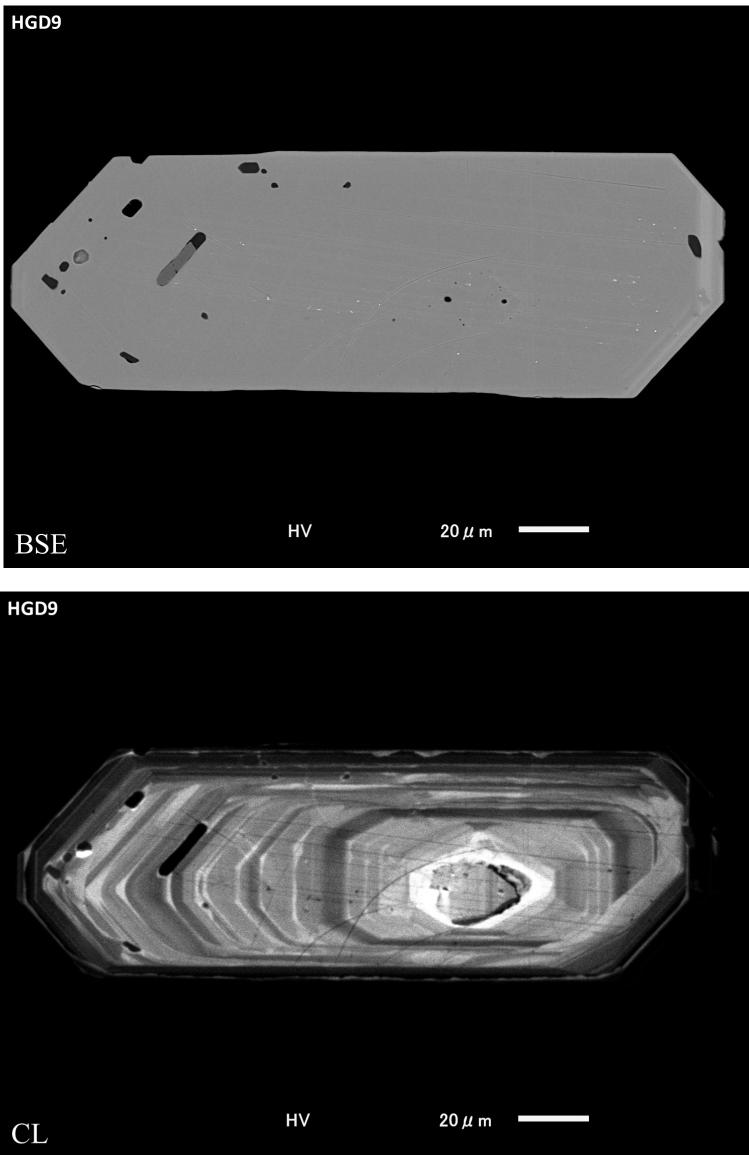


**BSE images**

**CL images**

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

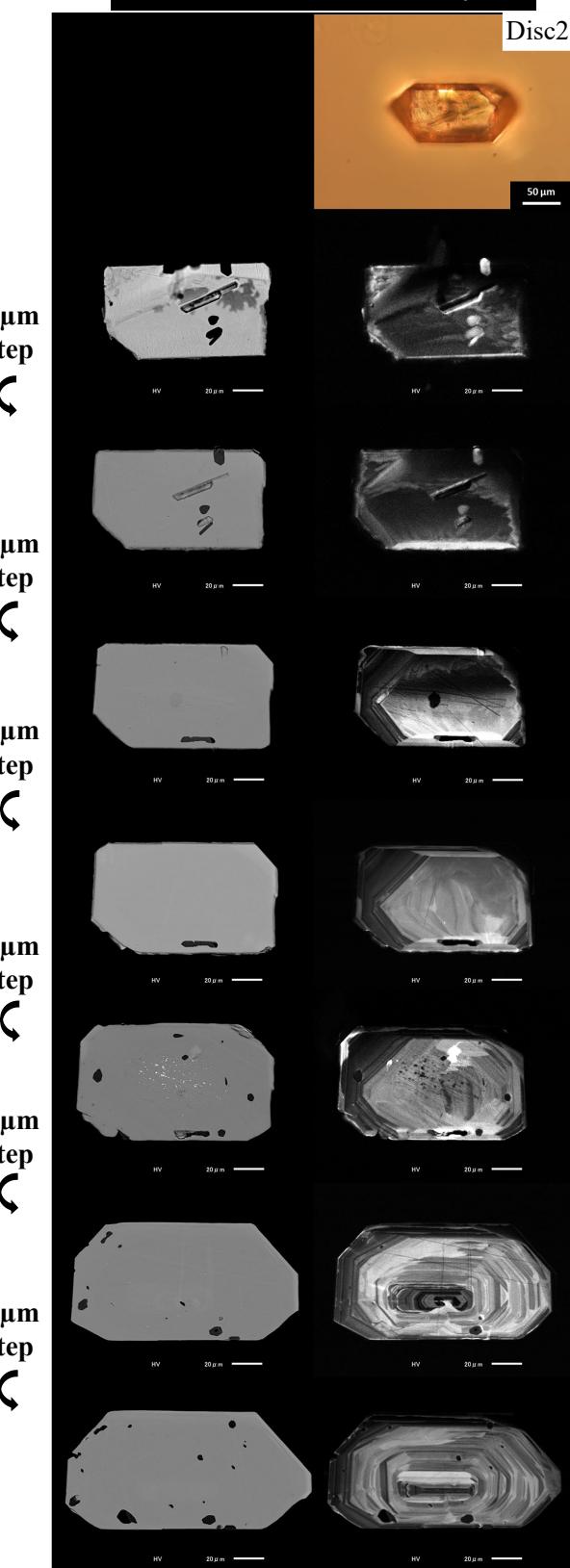
- Type {100}
- Major axis: 204 μm
- Minor axis: 74 μm
- Major axis/Minor axis: 2.8

**Observed internal texture**

- OZ
- CT
- IHC

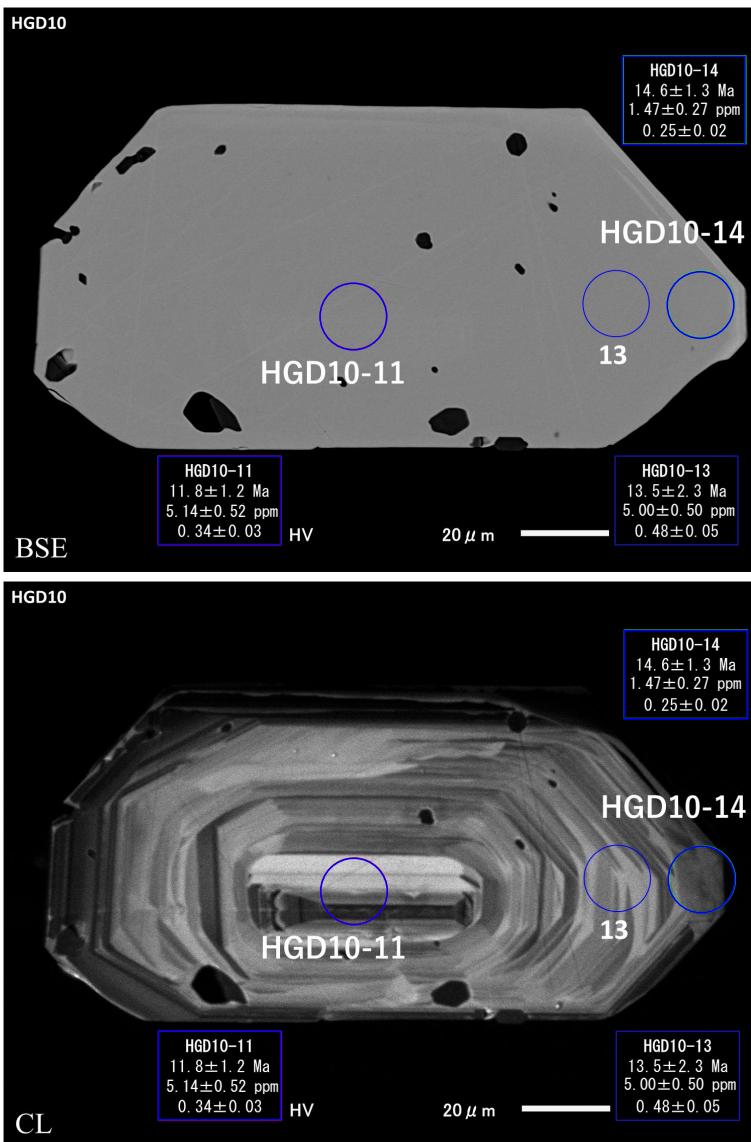
Fig. 68 Zircon data of grain No. HGD9

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

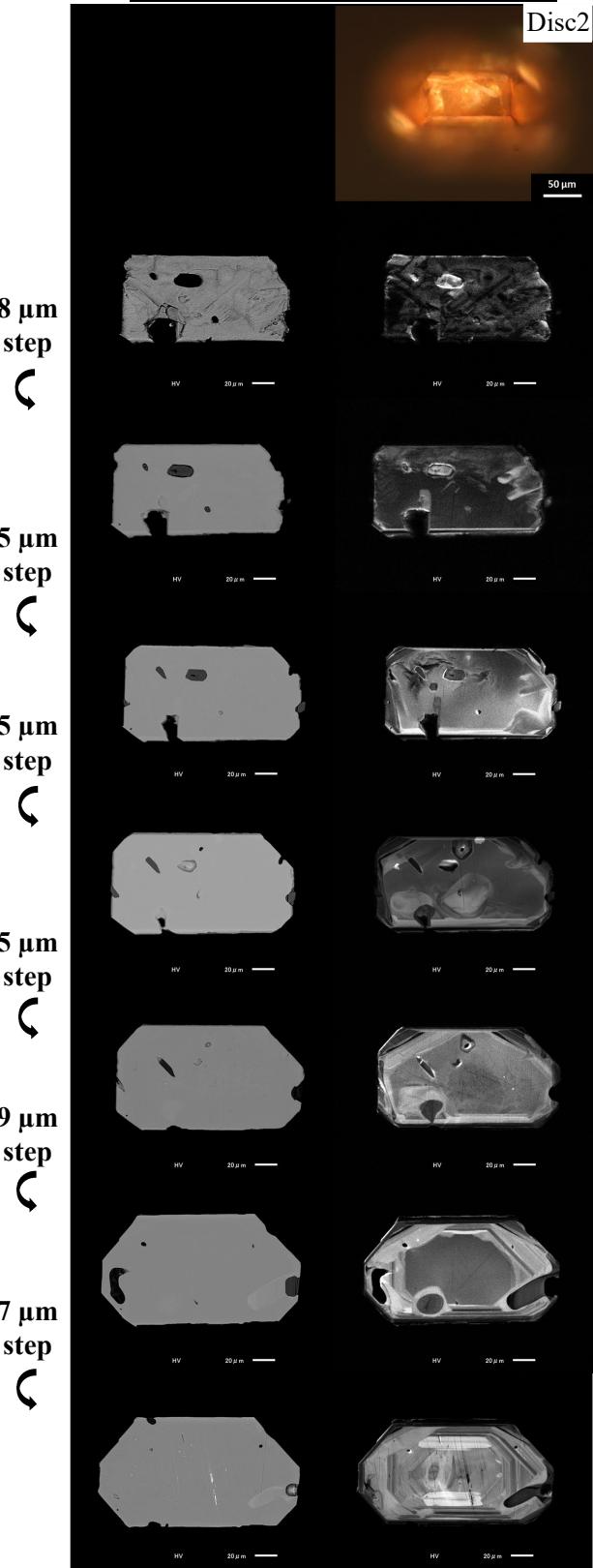
- Type {100}
- Major axis: 170  $\mu$ m
- Minor axis: 79  $\mu$ m
- Major axis/Minor axis: 2.2

## Observed internal texture

- OZ
- PT
- CT

Fig. 69 Zircon data of grain No. HGD10

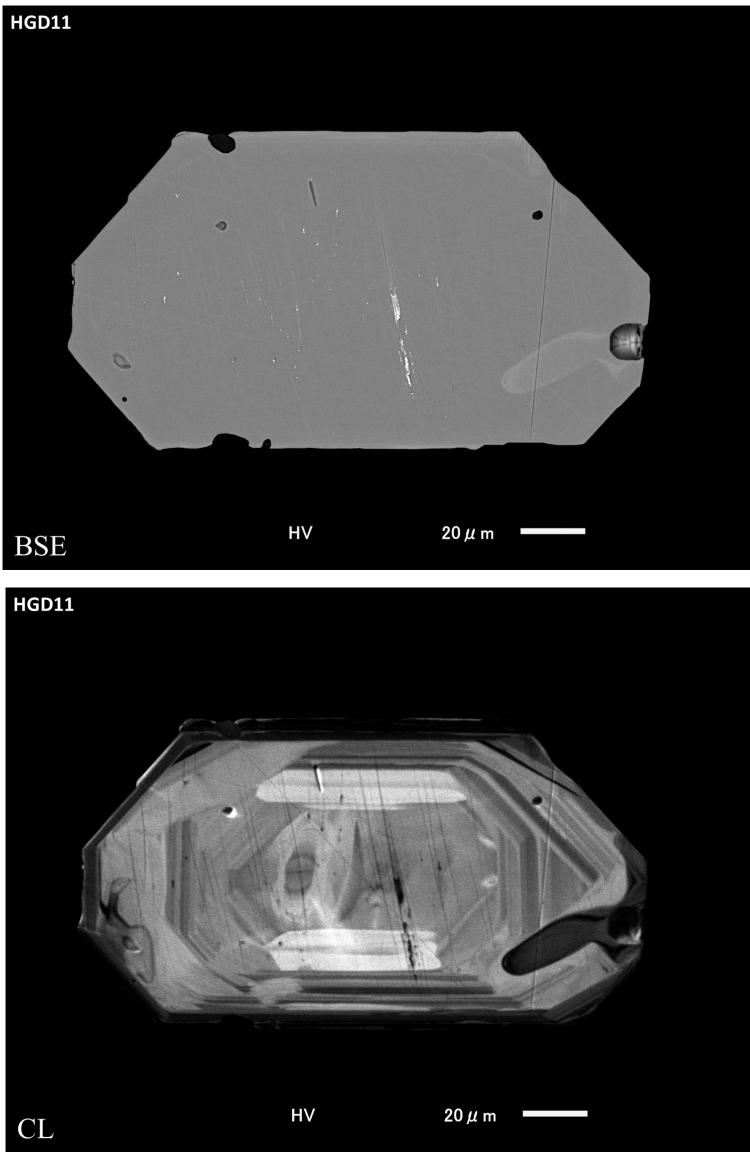
**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**



**Morphological description**

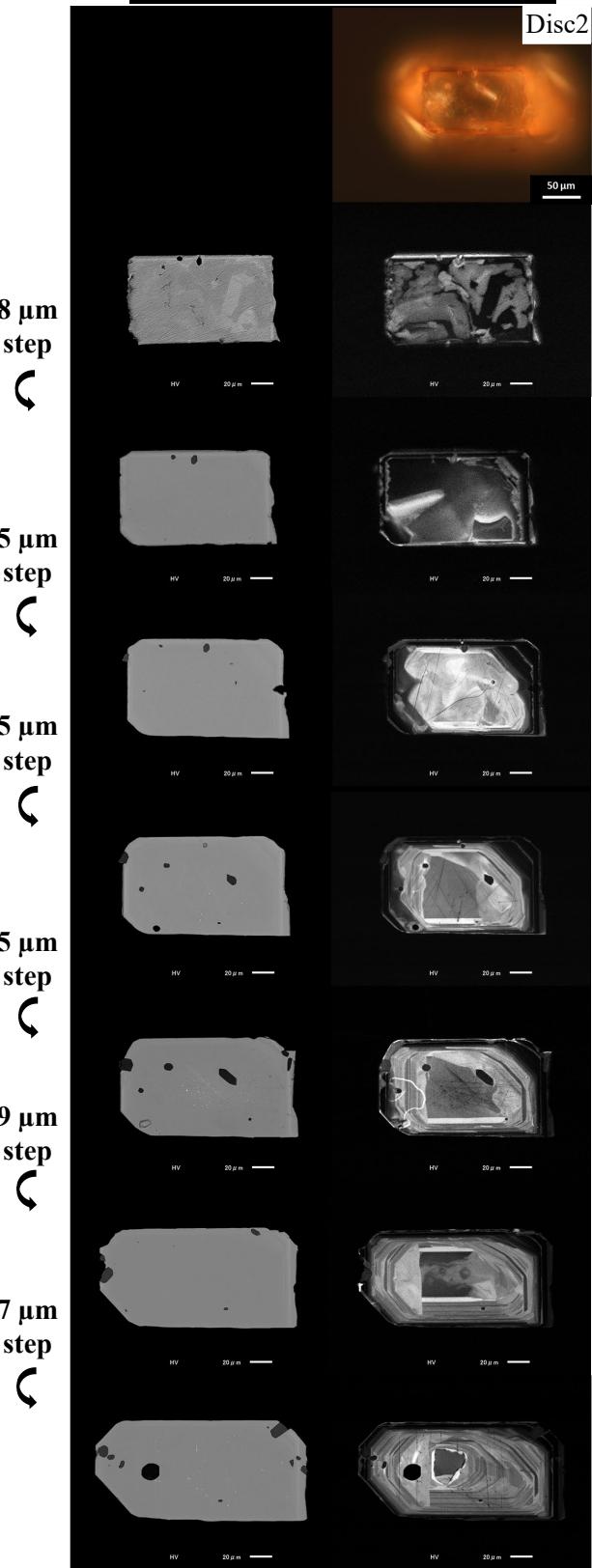
- Type {100}
- Major axis: 174  $\mu\text{m}$
- Minor axis: 72  $\mu\text{m}$
- Major axis/Minor axis: 2.4

**Observed internal texture**

- OZ
- PT
- CT

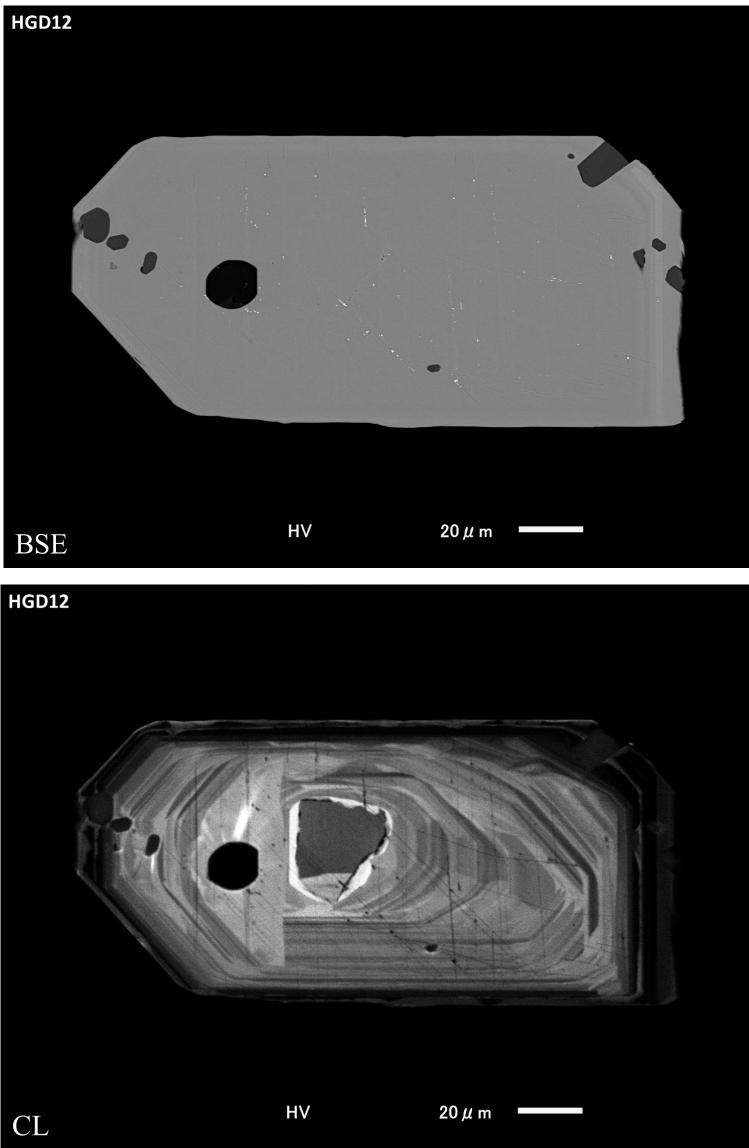
Fig. 70 Zircon data of grain No. HGD11

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

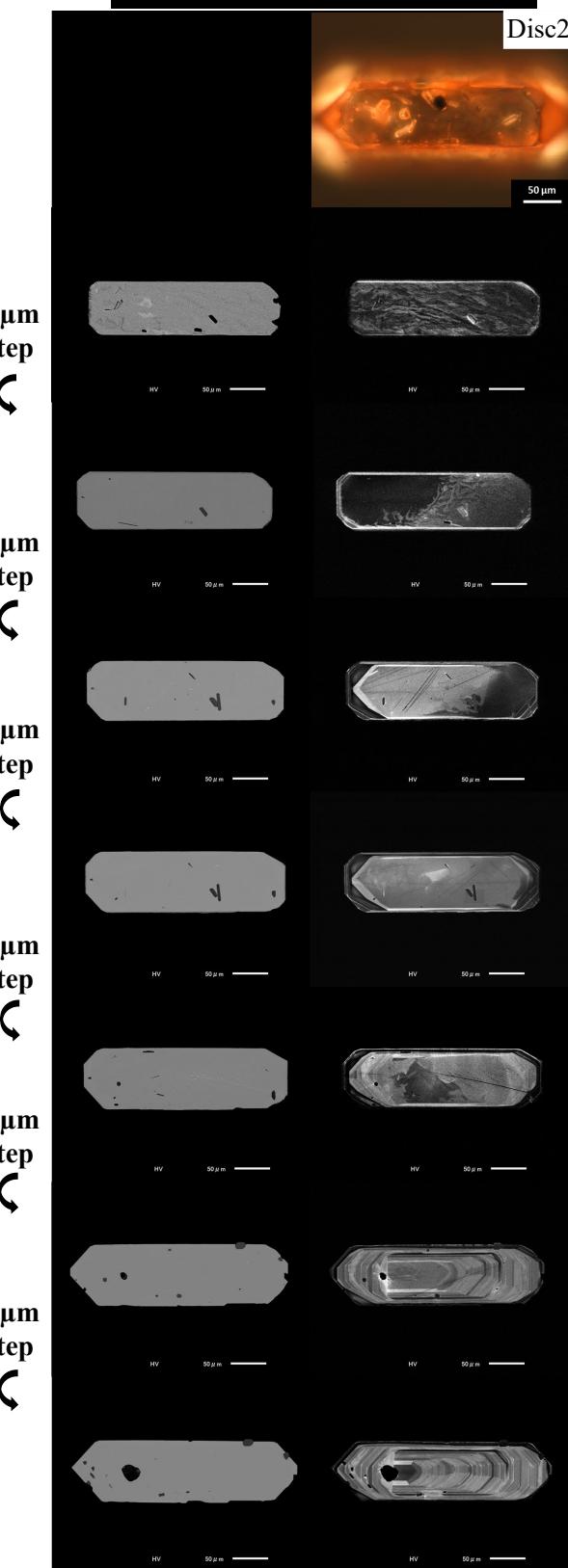
- Type {100}
- Major axis: 210  $\mu\text{m}$
- Minor axis: 89  $\mu\text{m}$
- Major axis/Minor axis: 2.4

**Observed internal texture**

- OZ
- PT
- CT
- IHC

Fig. 71 Zircon data of grain No. HGD12

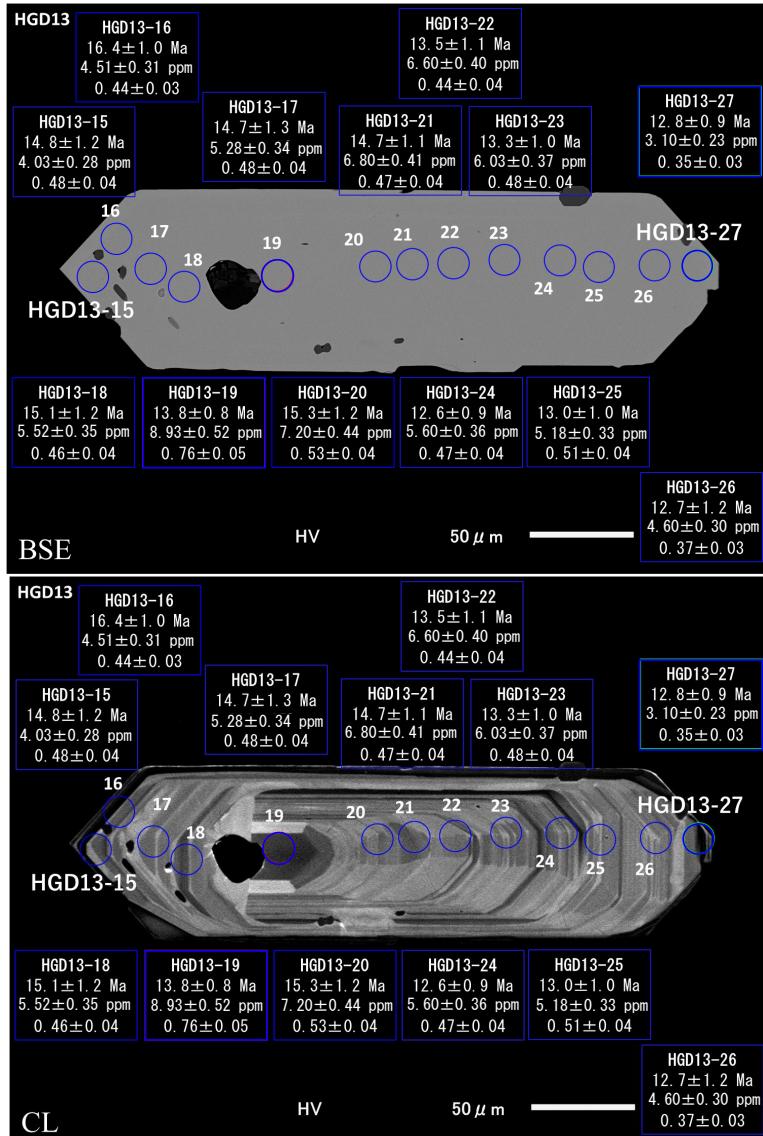
## Morphological observation and CL observation for multi-layers



CL images

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

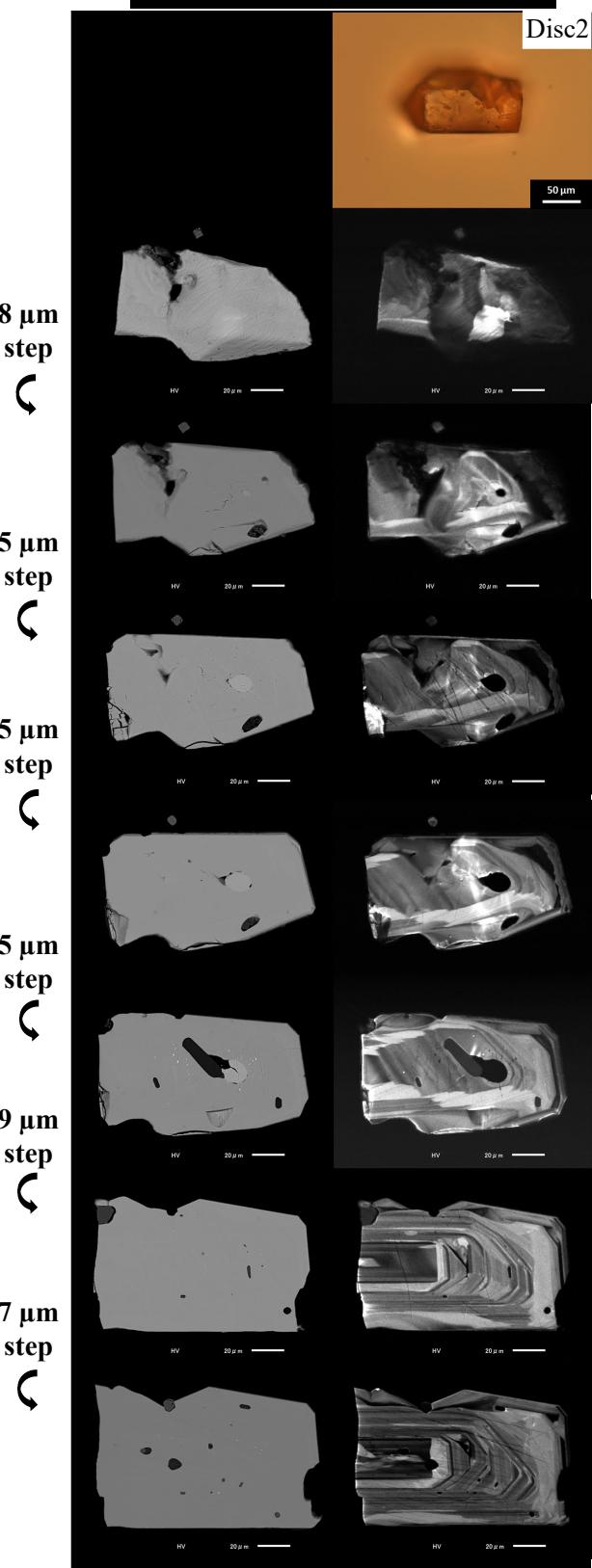
- Type {100}
- Major axis: 160 μm
- Minor axis: 87 μm
- Major axis/Minor axis: 1.8

## Observed internal texture

- OZ
- PT
- CT

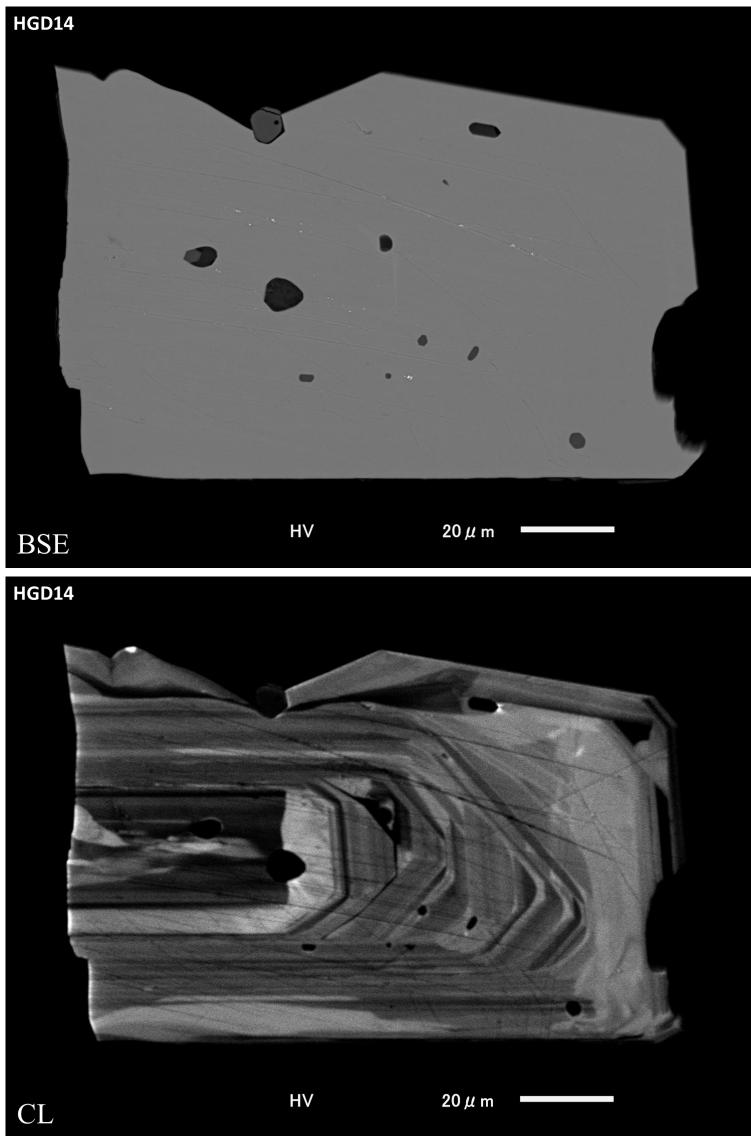
Fig. 72 Zircon data of grain No. HGD13

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

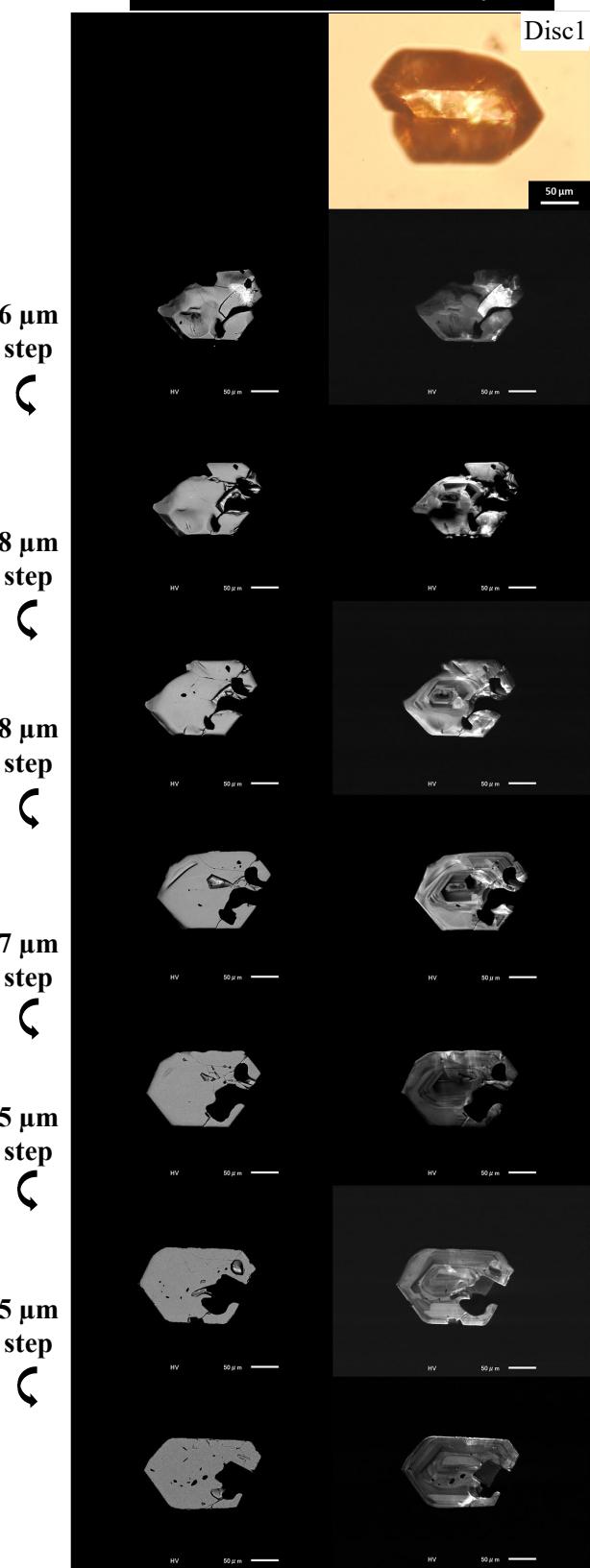
- Type {100}
- Major axis: 332  $\mu\text{m}$
- Minor axis: 89  $\mu\text{m}$
- Major axis/Minor axis: 3.7

**Observed internal texture**

- OZ
- PT

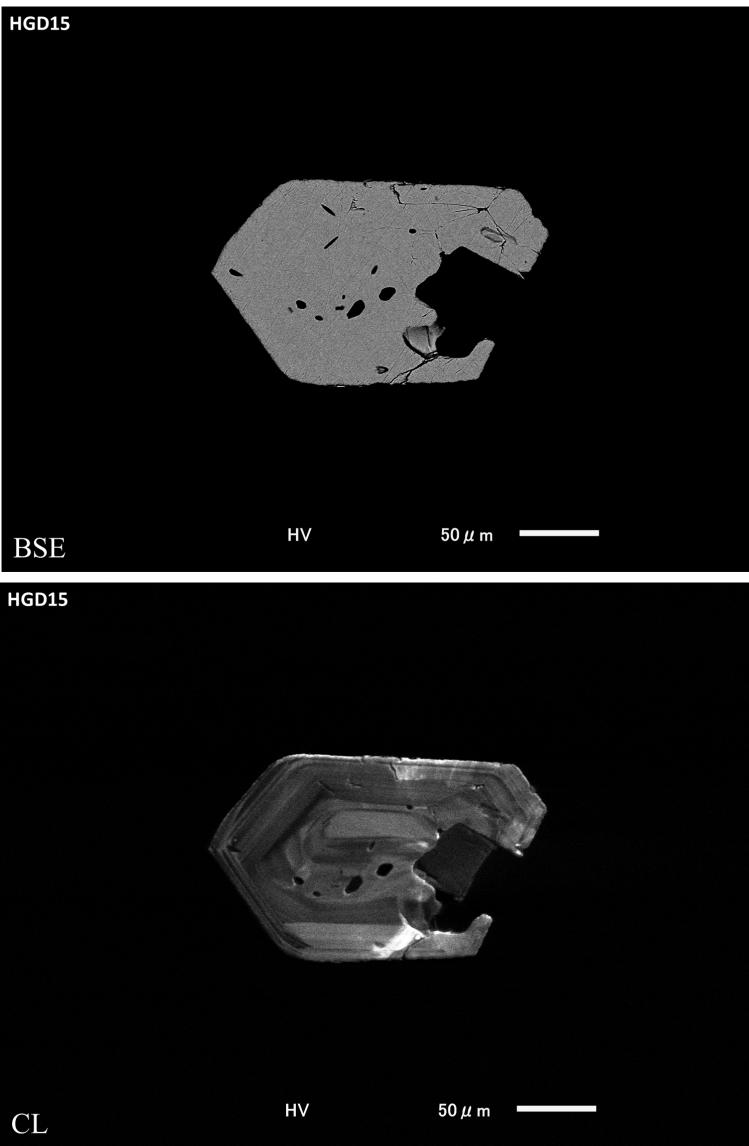
Fig. 73 Zircon data of grain No. HGD14

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

- Type –not classified
- Major axis: 220  $\mu\text{m}$
- Minor axis: 156  $\mu\text{m}$
- Major axis/Minor axis: 1.4

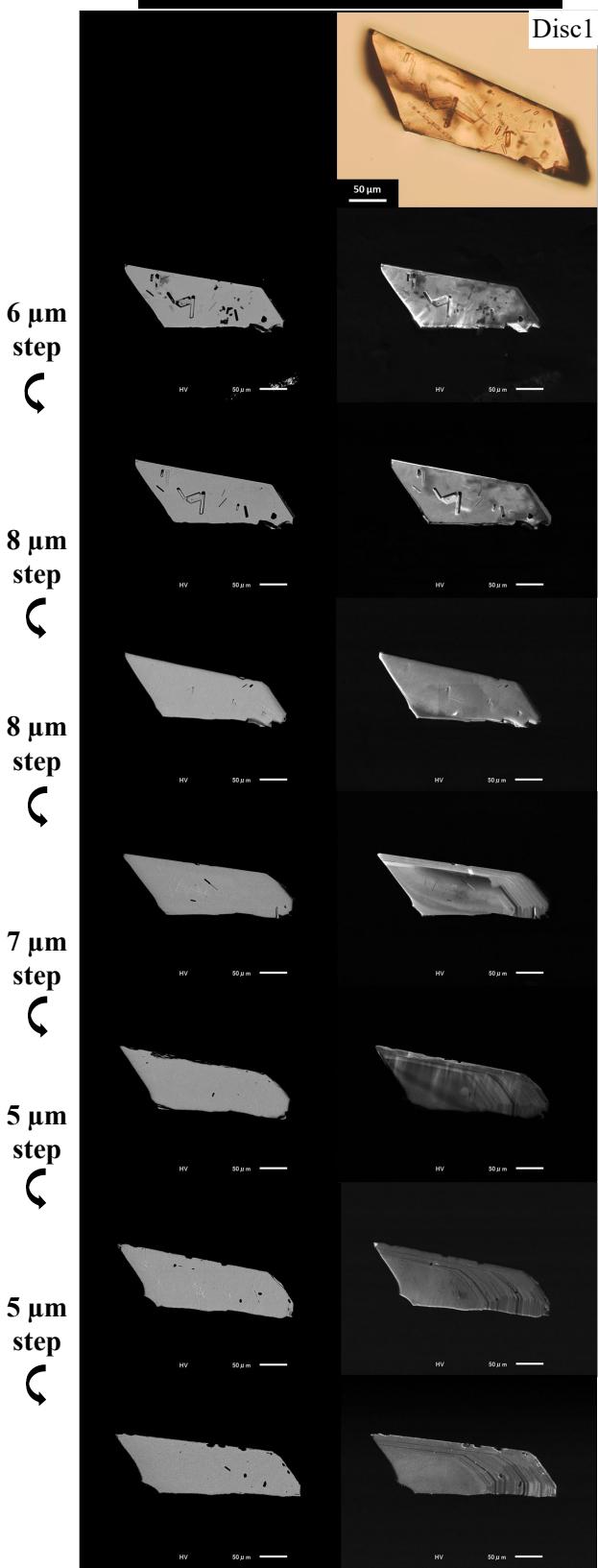
**Observed internal texture**

- OZ

**BSE images**      **CL images**

Fig. 74 Zircon data of grain No. HGD15

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :

HGD16

BSE

HV

50  $\mu\text{m}$

HGD16

HV

50  $\mu\text{m}$

**Morphological description**

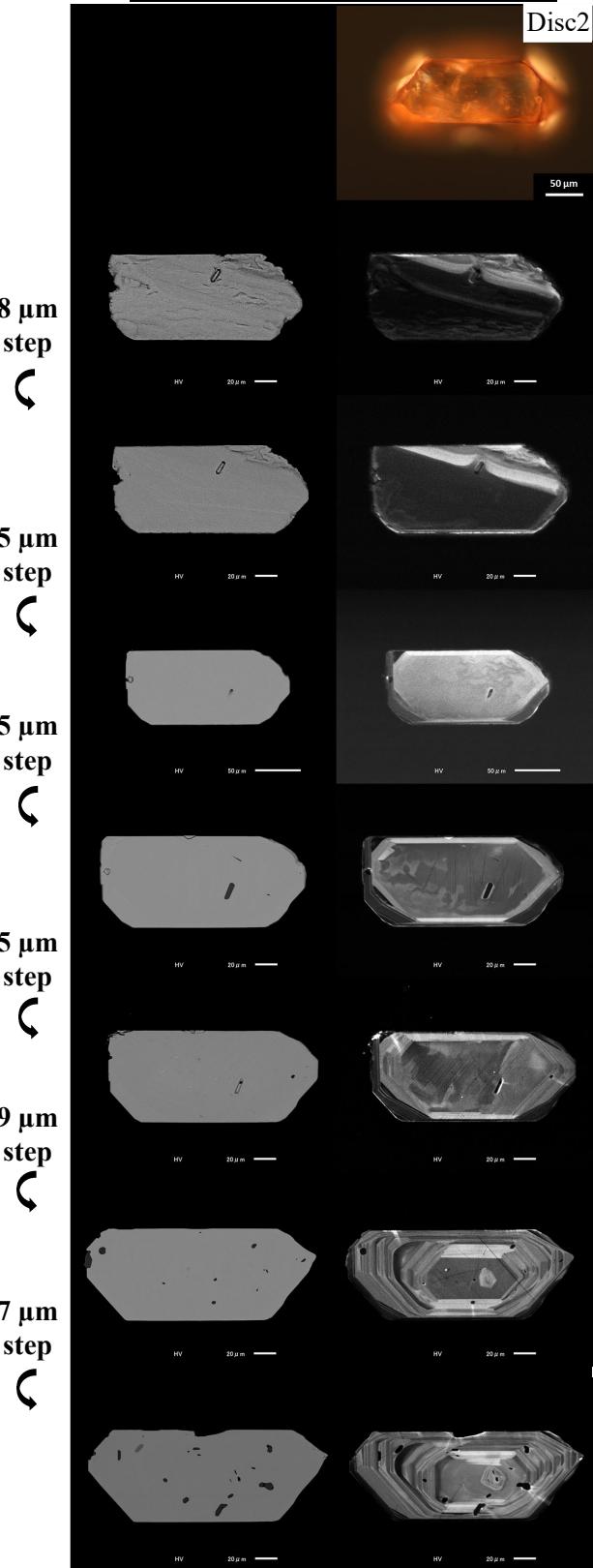
- Type –not classified
- Major axis: 345  $\mu\text{m}$
- Minor axis: 106  $\mu\text{m}$
- Major axis/Minor axis: 3.3

**Observed internal texture**

- OZ

Fig. 75 Zircon data of grain No. HGD16

**Morphological observation and CL observation for multi-layers**

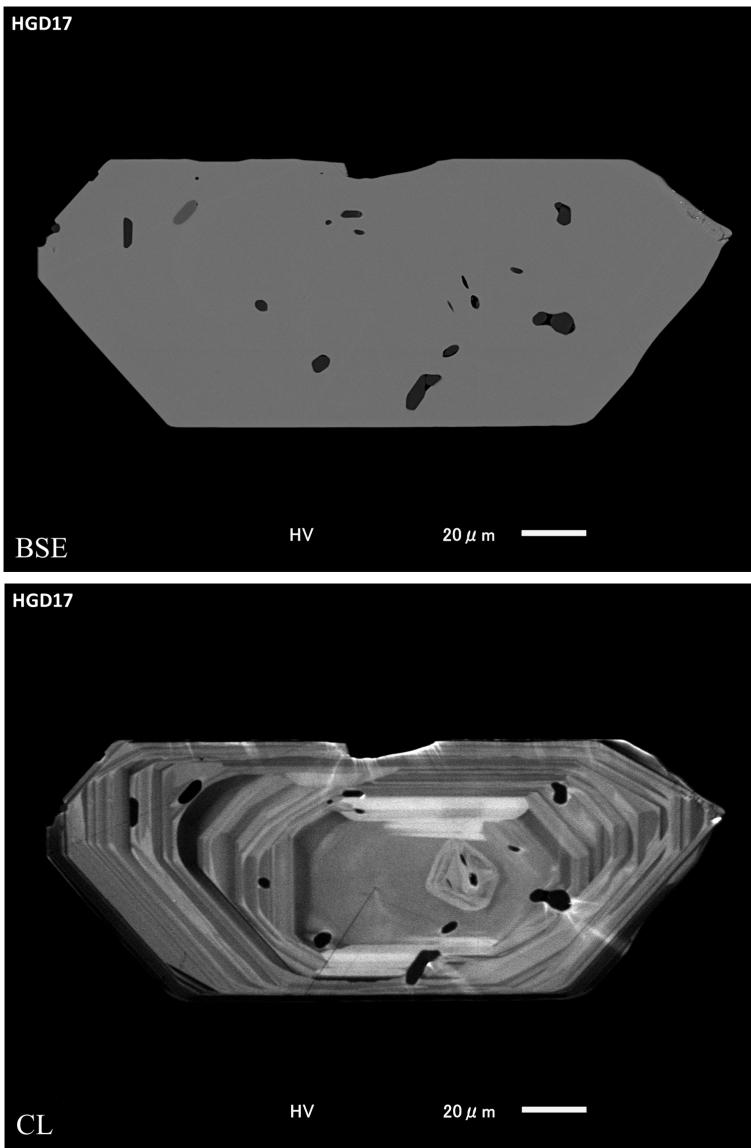


**BSE images**

**CL images**

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

- Type {100}
- Major axis: 218  $\mu$ m
- Minor axis: 85  $\mu$ m
- Major axis/Minor axis: 2.6

**Observed internal texture**

- OZ
- PT

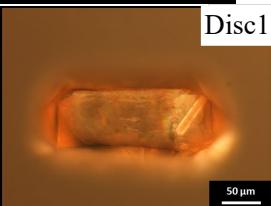
**Fig. 76 Zircon data of grain No. HGD17**

## Morphological observation and CL observation for multi-layers

6  $\mu\text{m}$   
step



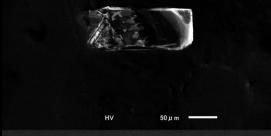
HV 50  $\mu\text{m}$



8  $\mu\text{m}$   
step



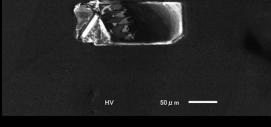
HV 50  $\mu\text{m}$



8  $\mu\text{m}$   
step



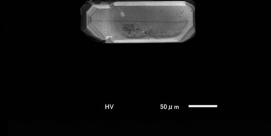
HV 50  $\mu\text{m}$



7  $\mu\text{m}$   
step



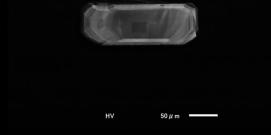
HV 50  $\mu\text{m}$



5  $\mu\text{m}$   
step



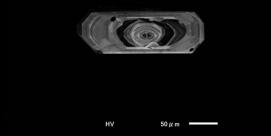
HV 50  $\mu\text{m}$



5  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$



BSE images

CL images

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :

HGD18

HGD18-6  
12.7  $\pm$  0.8 Ma  
3.71  $\pm$  0.36 ppm  
0.36  $\pm$  0.03

HGD18-9  
91.0  $\pm$  3.8 Ma  
5.45  $\pm$  0.47 ppm  
0.36  $\pm$  0.03

HGD18-6

HGD18-8

HGD18-10

HGD18-7

HGD18-8  
13.2  $\pm$  1.6 Ma  
6.92  $\pm$  0.56 ppm  
0.54  $\pm$  0.04

HGD18-10  
115.6  $\pm$  4.1 Ma  
3.72  $\pm$  0.37 ppm  
0.24  $\pm$  0.02

HGD18-10  
111.5  $\pm$  9.2 Ma  
8.36  $\pm$  0.64 ppm  
0.36  $\pm$  0.04

BSE

HGD18

HGD18-6  
12.7  $\pm$  0.8 Ma  
3.71  $\pm$  0.36 ppm  
0.36  $\pm$  0.03

HGD18-9  
91.0  $\pm$  3.8 Ma  
5.45  $\pm$  0.47 ppm  
0.36  $\pm$  0.03

HGD18-6

HGD18-8

HGD18-10

HGD18-7

HGD18-8  
13.2  $\pm$  1.6 Ma  
6.92  $\pm$  0.56 ppm  
0.54  $\pm$  0.04

HGD18-10  
115.6  $\pm$  4.1 Ma  
3.72  $\pm$  0.37 ppm  
0.24  $\pm$  0.02

HGD18-10  
111.5  $\pm$  9.2 Ma  
8.36  $\pm$  0.64 ppm  
0.36  $\pm$  0.04

CL

HV 20  $\mu\text{m}$

## Morphological description

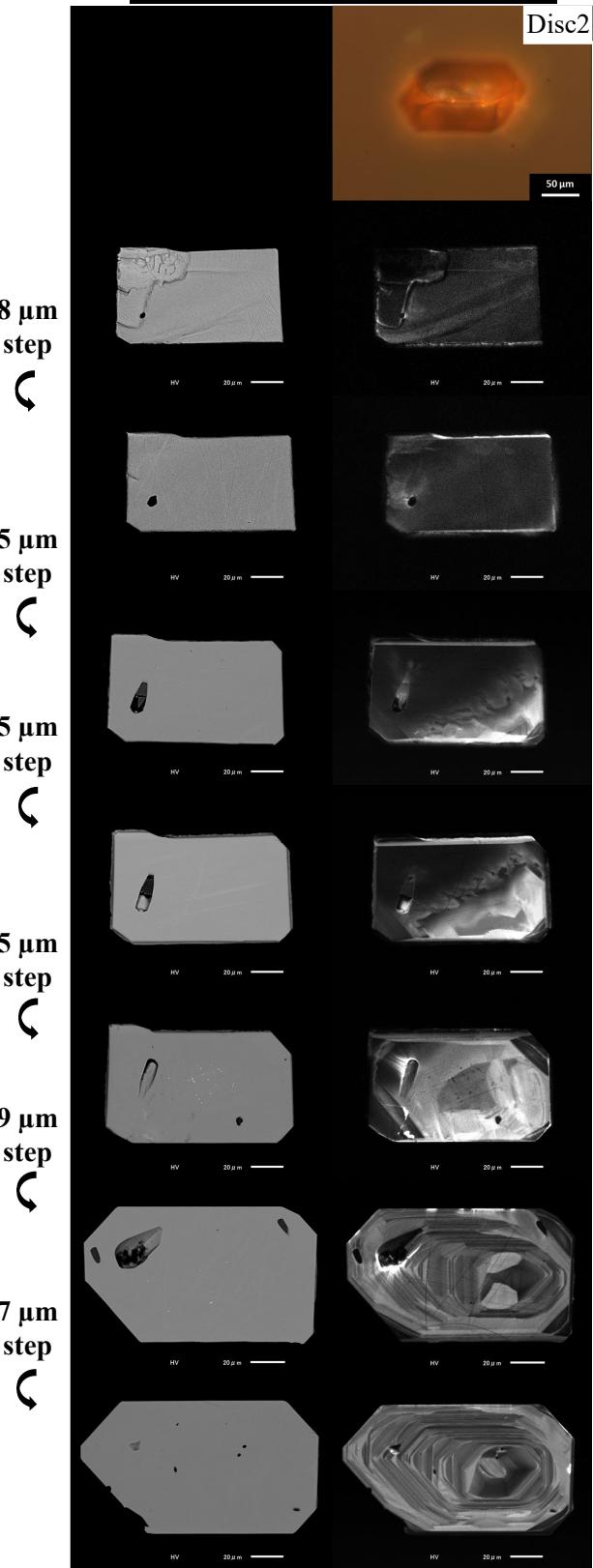
- Type {100}
- Major axis: 232  $\mu\text{m}$
- Minor axis: 93  $\mu\text{m}$
- Major axis/Minor axis: 2.5

## Observed internal texture

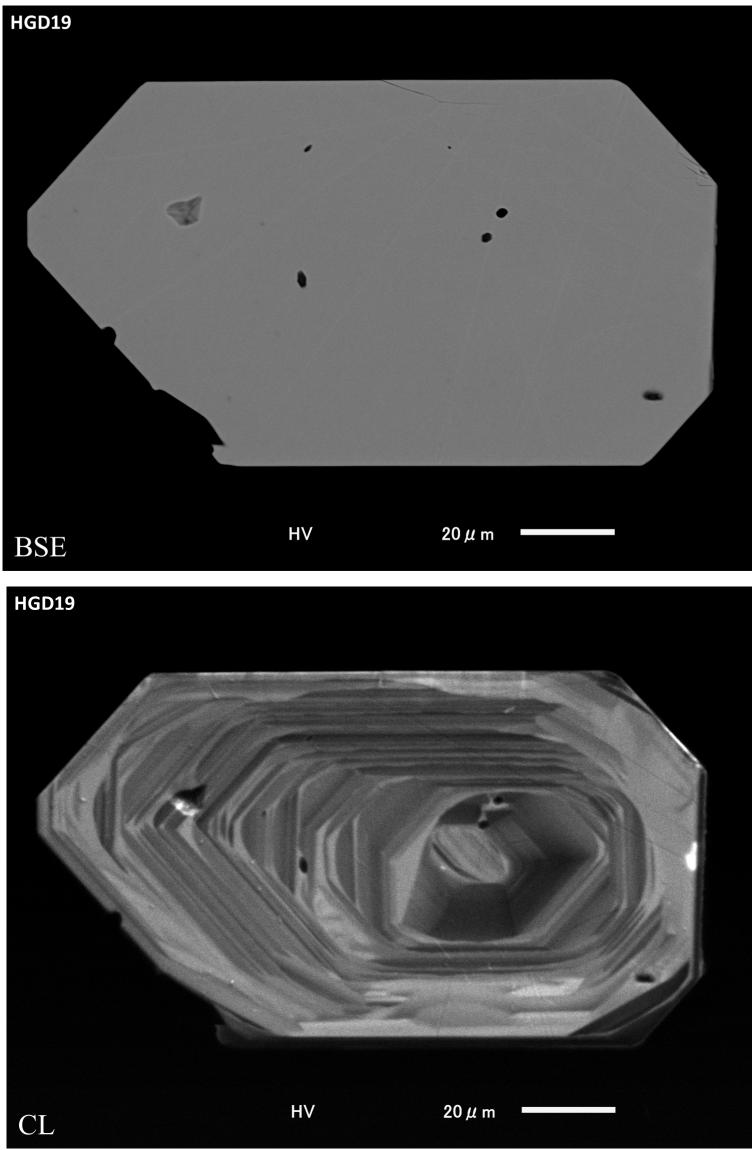
- OZ
- PT
- CT
- IHC

Fig. 77 Zircon data of grain No. HGD18

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**



**Morphological description**

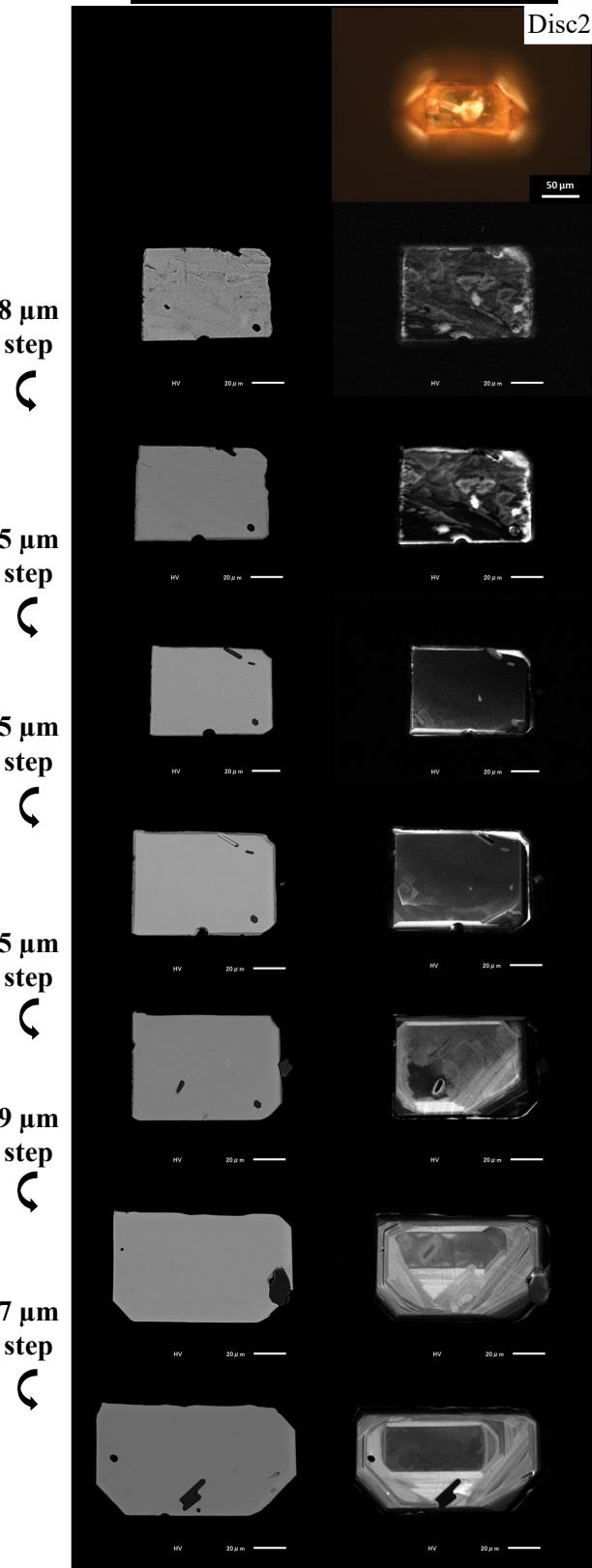
- Type {100}
- Major axis: 160  $\mu\text{m}$
- Minor axis: 87  $\mu\text{m}$
- Major axis/Minor axis: 1.8

**Observed internal texture**

- OZ
- PT
- CT

Fig. 78 Zircon data of grain No. HGD19

**Morphological observation and CL observation for multi-layers**

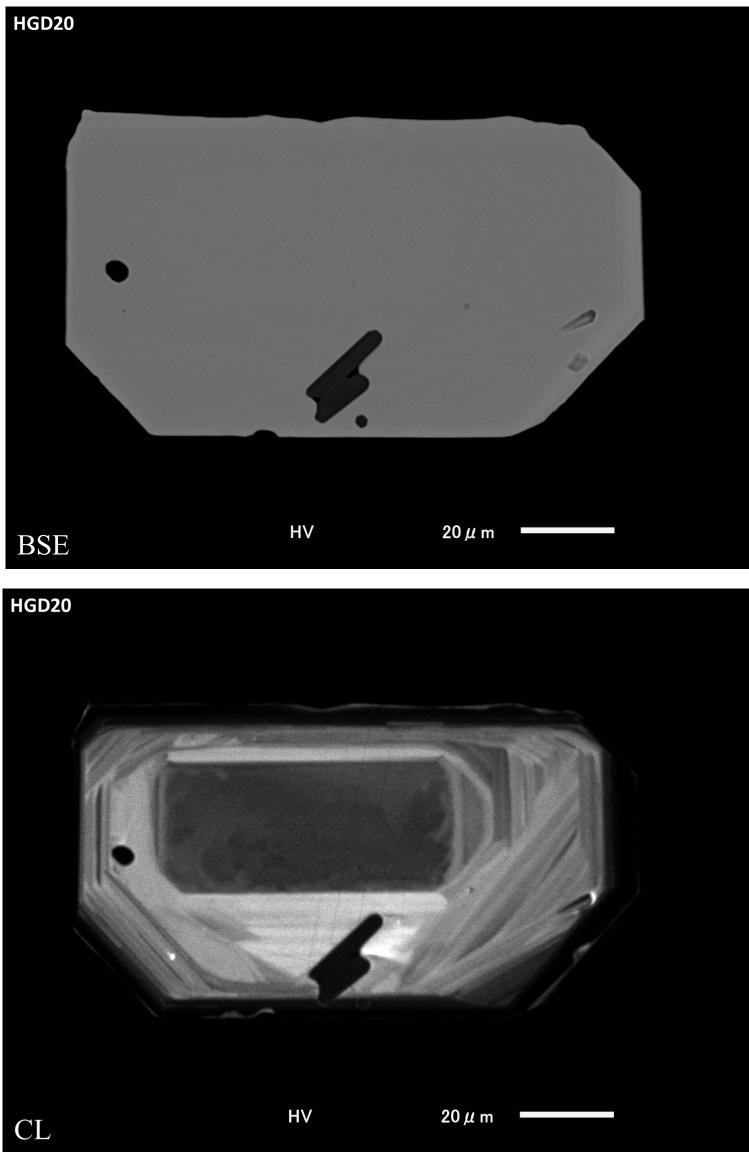


**BSE images**

**CL images**

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

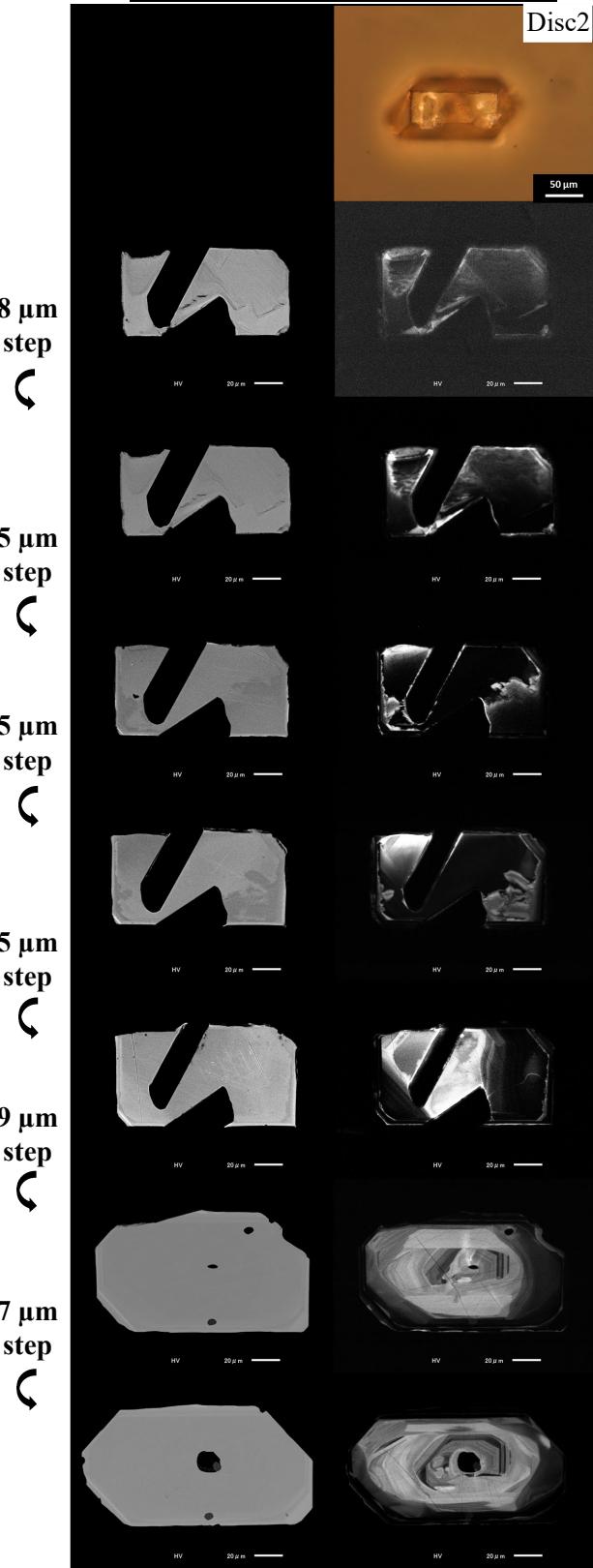
- Type {100}
- Major axis: 166 μm
- Minor axis: 74 μm
- Major axis/Minor axis: 2.2

**Observed internal texture**

- OZ
- PT

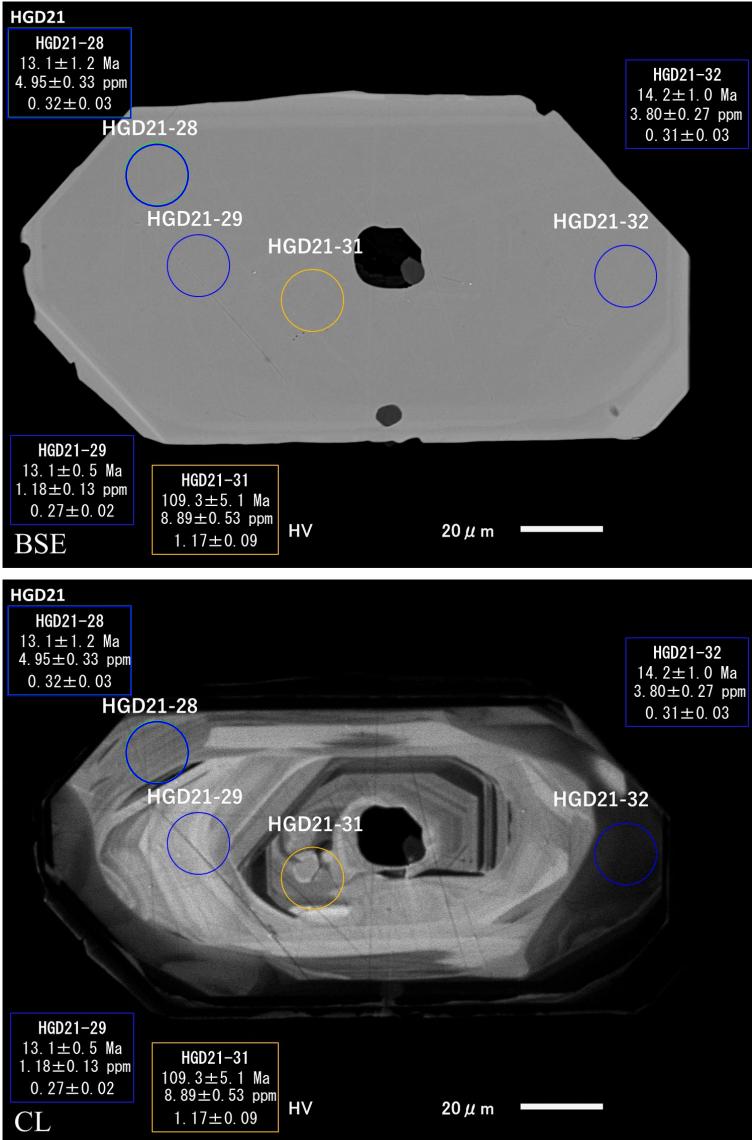
**Fig. 79 Zircon data of grain No. HGD20**

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

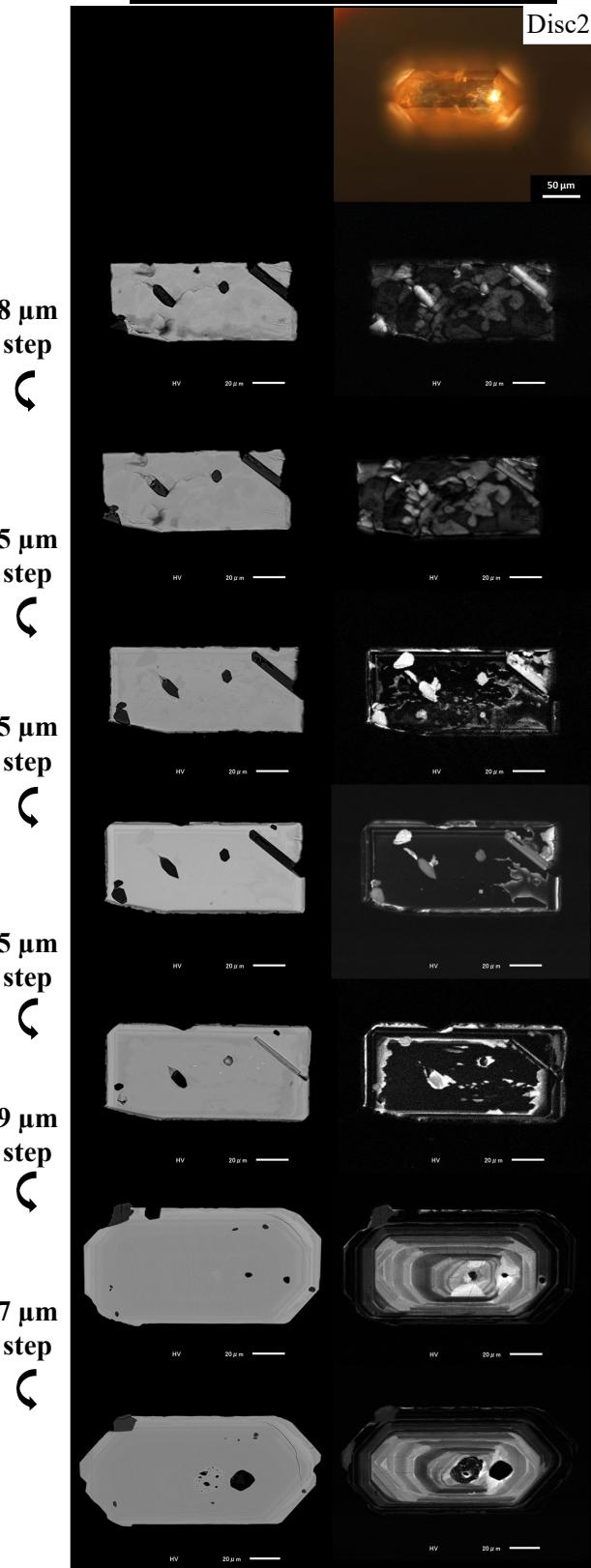
- Type {100}
- Major axis: 177  $\mu\text{m}$
- Minor axis: 81  $\mu\text{m}$
- Major axis/Minor axis: 2.2

## Observed internal texture

- OZ
- PT
- CT

Fig. 80 Zircon data of grain No. HGD21

**Morphological observation and CL observation for multi-layers**

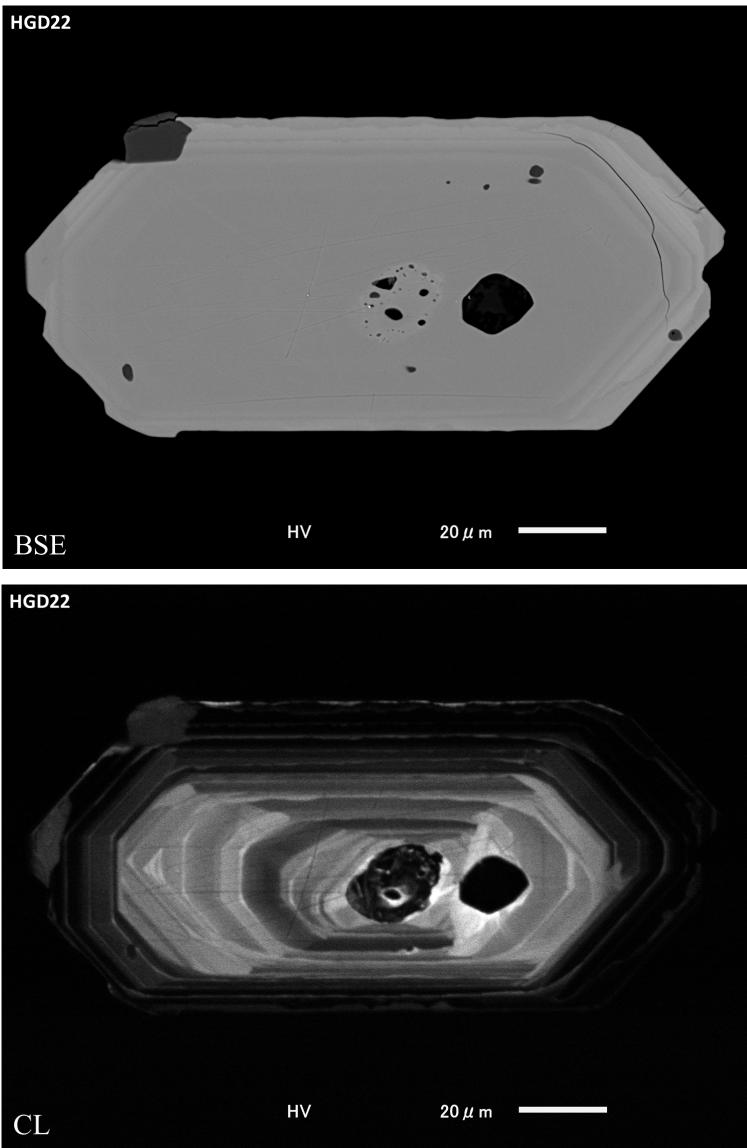


**BSE images**

**CL images**

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

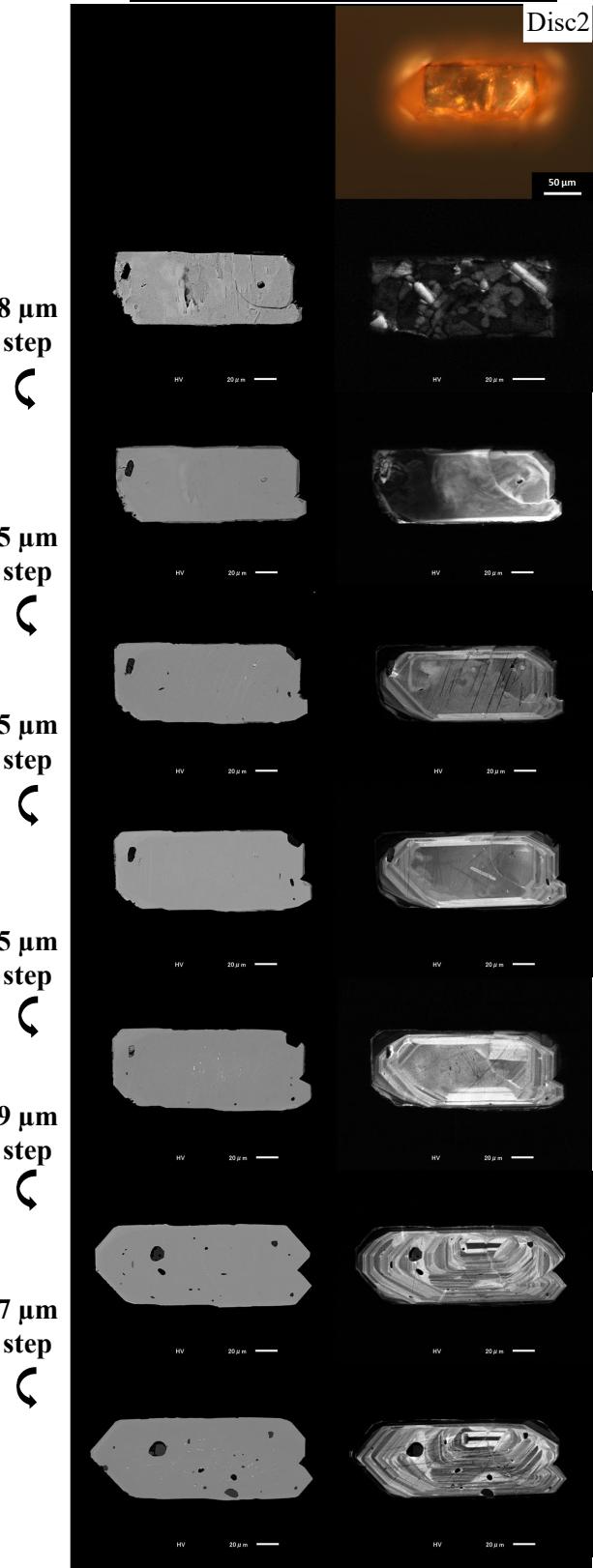
- Type {100}
- Major axis: 175  $\mu\text{m}$
- Minor axis: 80  $\mu\text{m}$
- Major axis/Minor axis: 2.2

**Observed internal texture**

- |      |       |
|------|-------|
| • OZ | • PT  |
| • CT | • IHC |

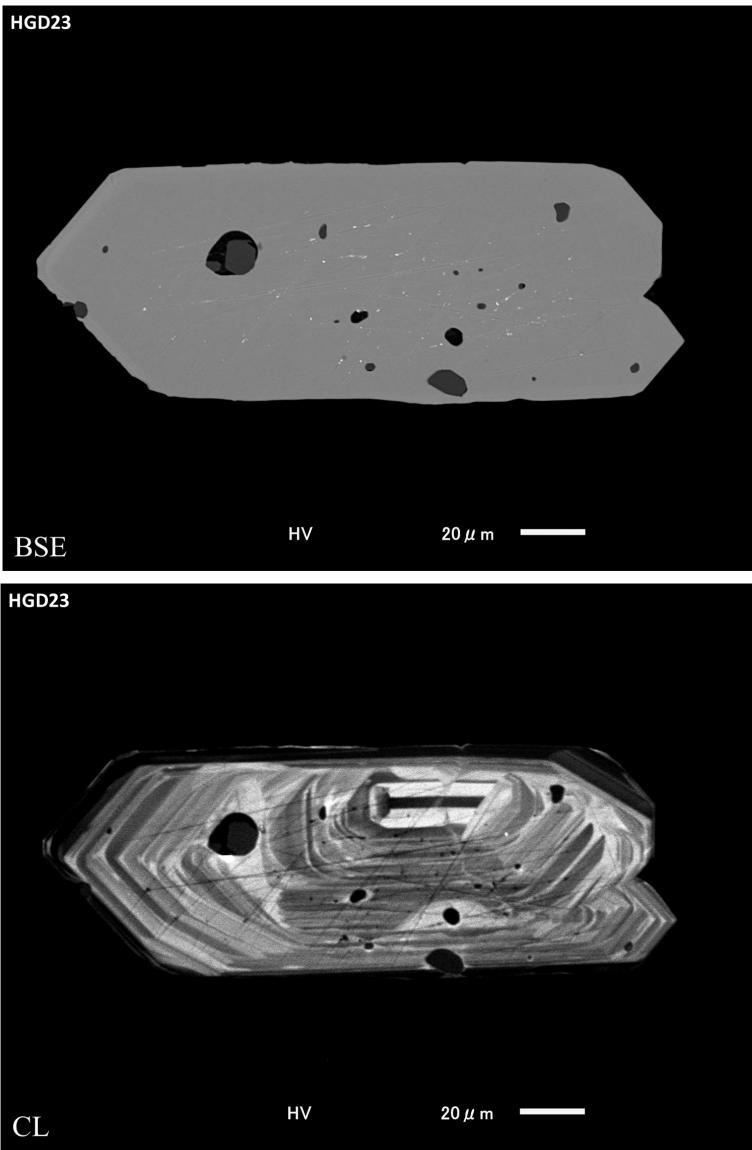
Fig. 81 Zircon data of grain No. HGD22

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

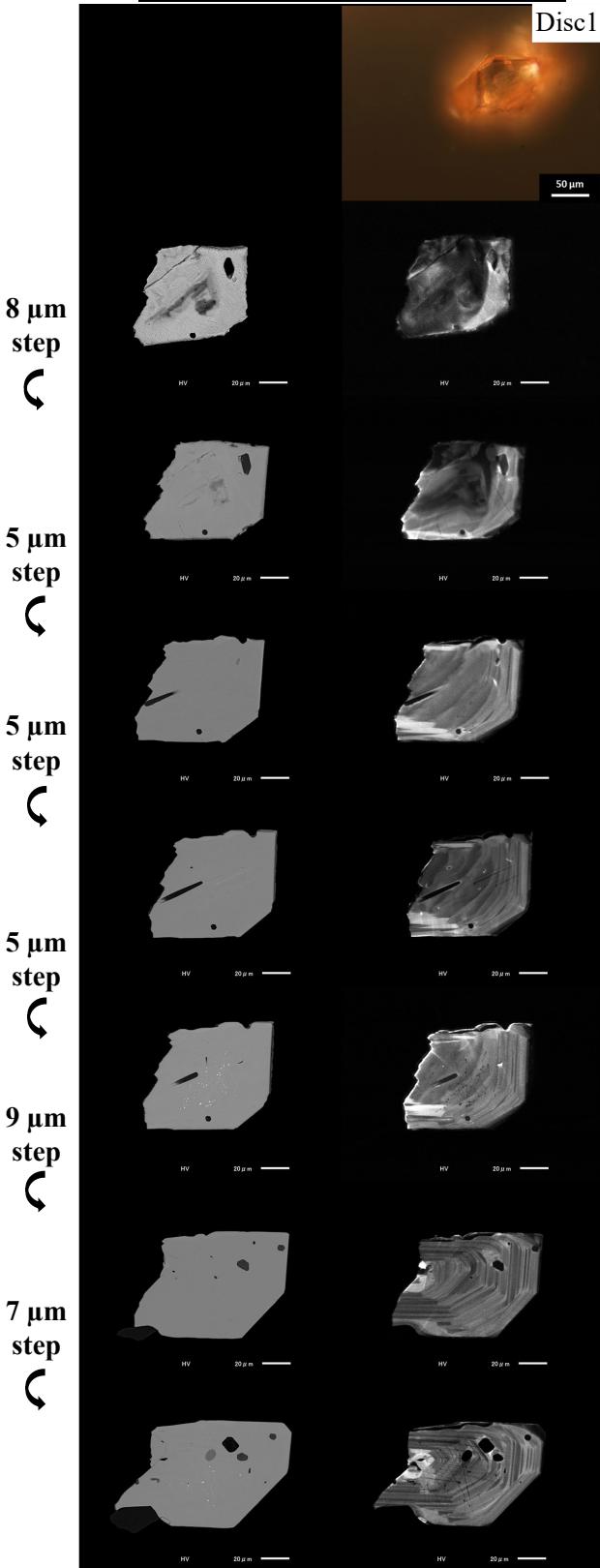
- Type {100}
- Major axis: 192  $\mu\text{m}$
- Minor axis: 78  $\mu\text{m}$
- Major axis/Minor axis: 2.5

**Observed internal texture**

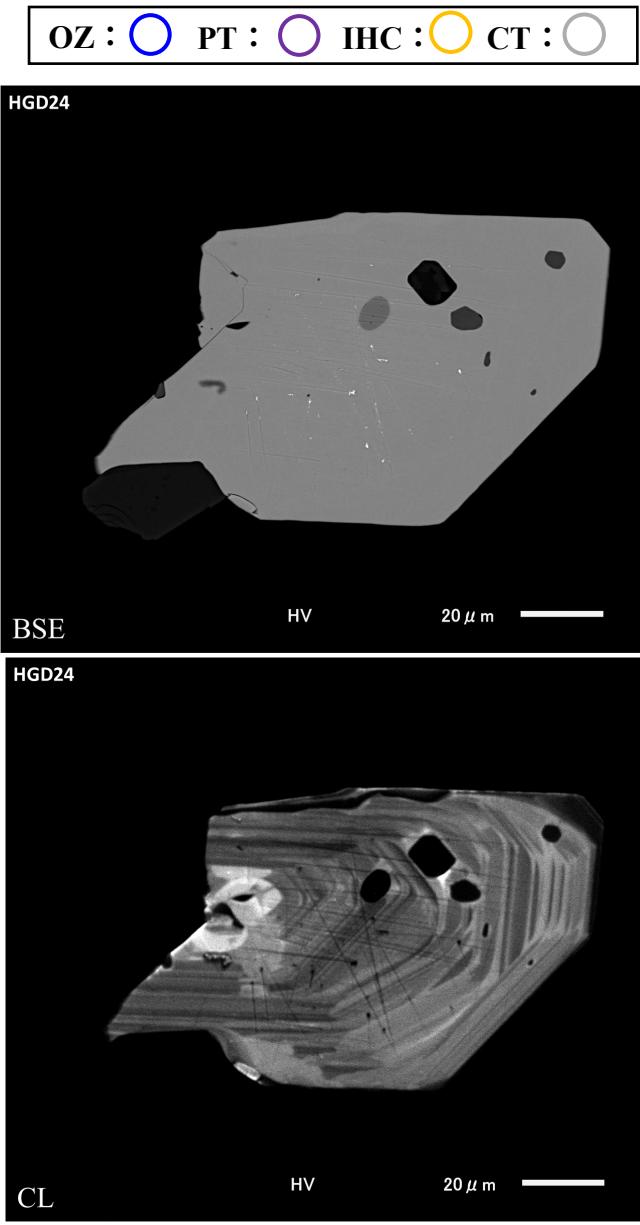
- OZ
- PT
- CT

Fig. 82 Zircon data of grain No. HGD23

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**



**Morphological description**

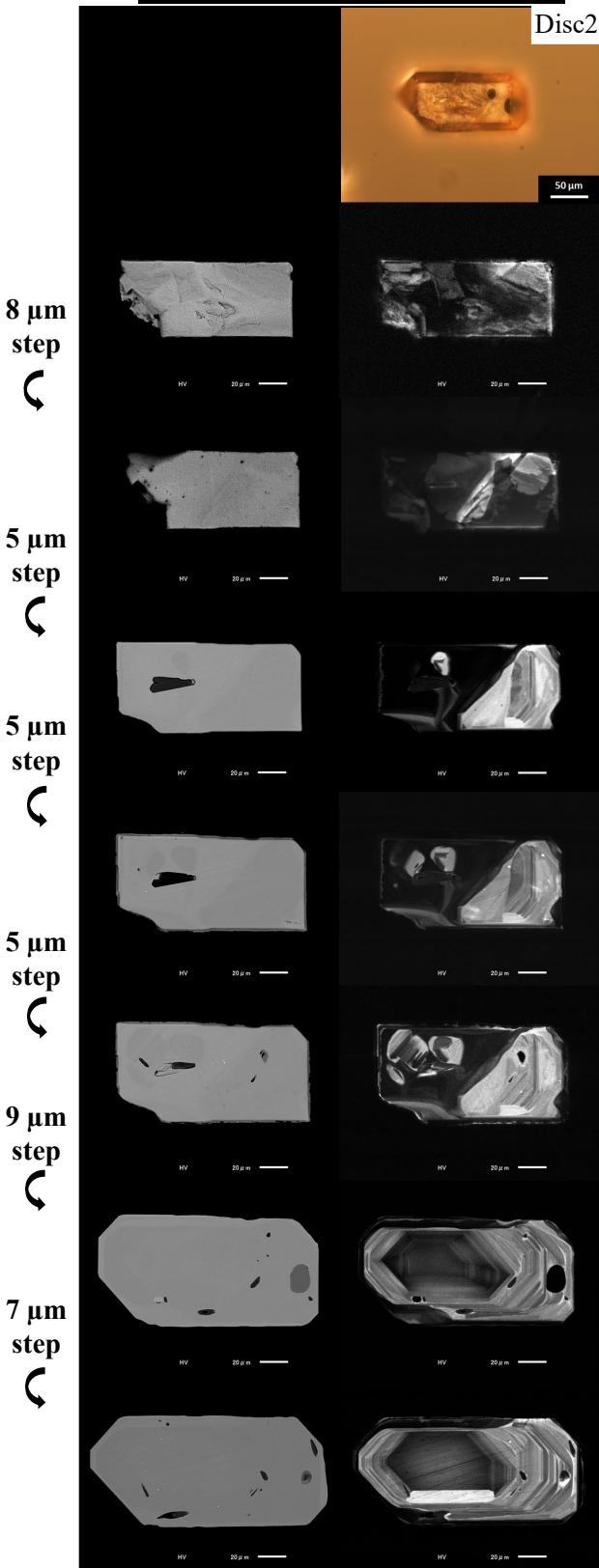
- Type {100}
- Major axis: 124  $\mu\text{m}$
- Minor axis: 74  $\mu\text{m}$
- Major axis/Minor axis: 1.7

**Observed internal texture**

- OZ
- PT

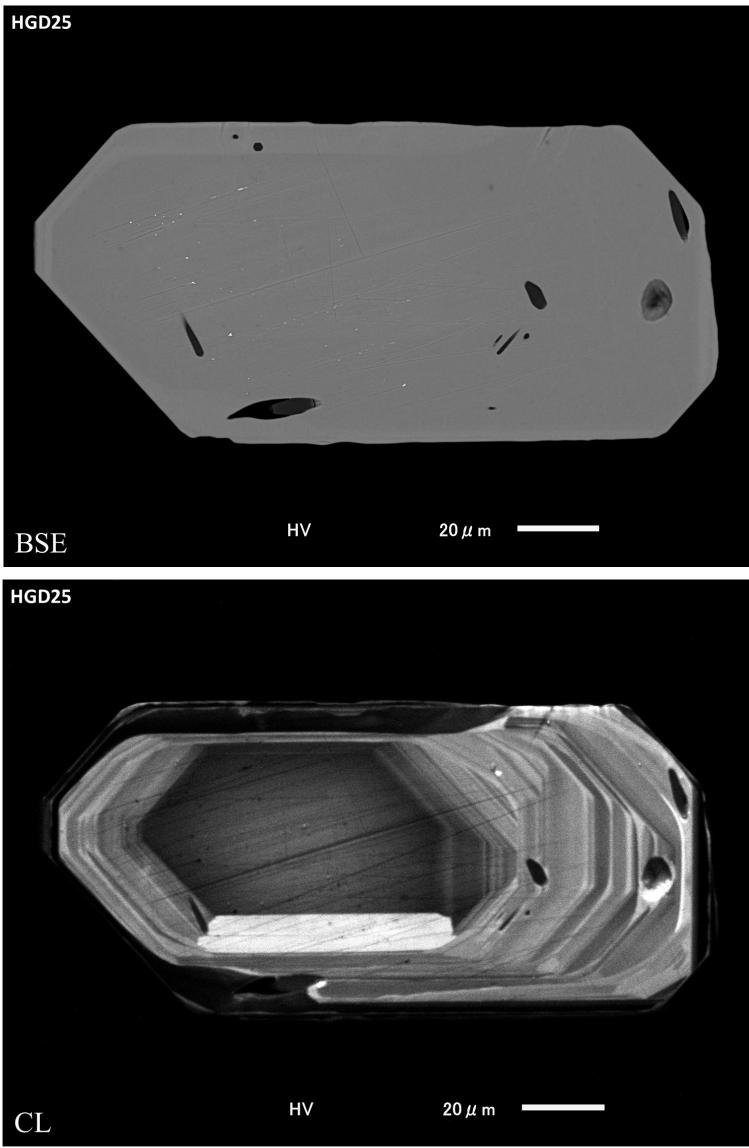
Fig. 83 Zircon data of grain No. HGD24

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

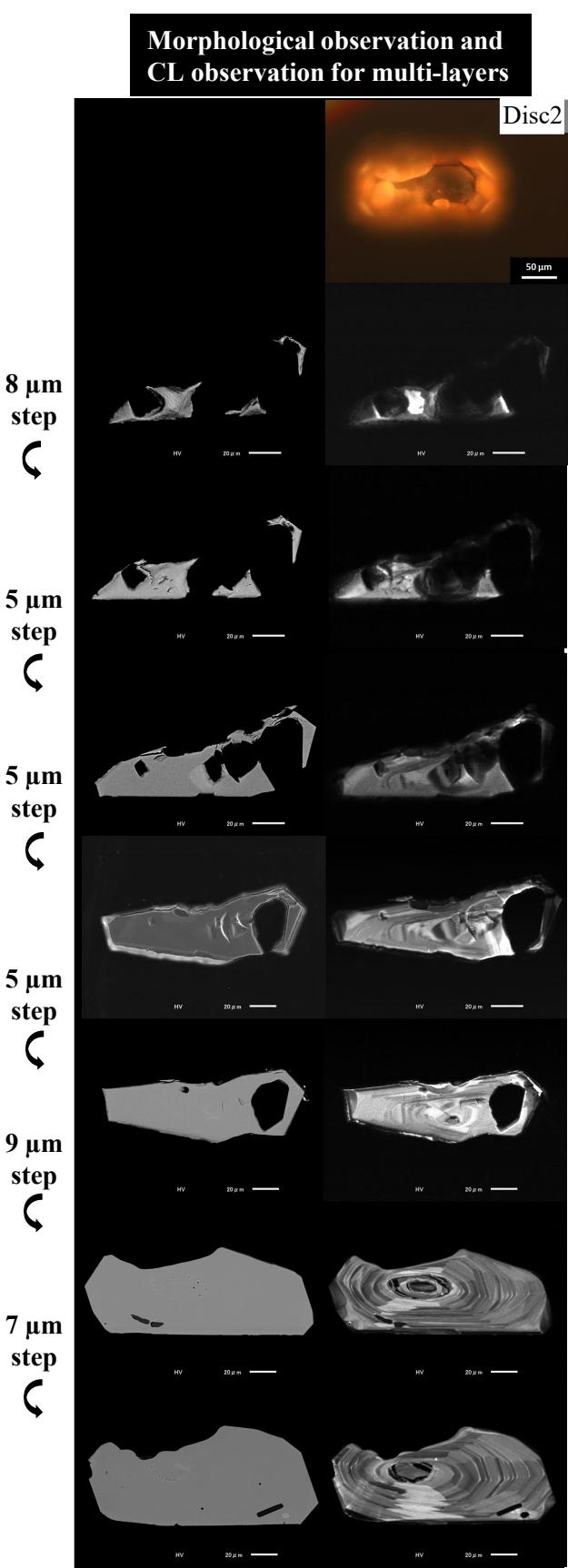
- Type {100}
- Major axis: 162  $\mu\text{m}$
- Minor axis: 77  $\mu\text{m}$
- Major axis/Minor axis: 2.1

**Observed internal texture**

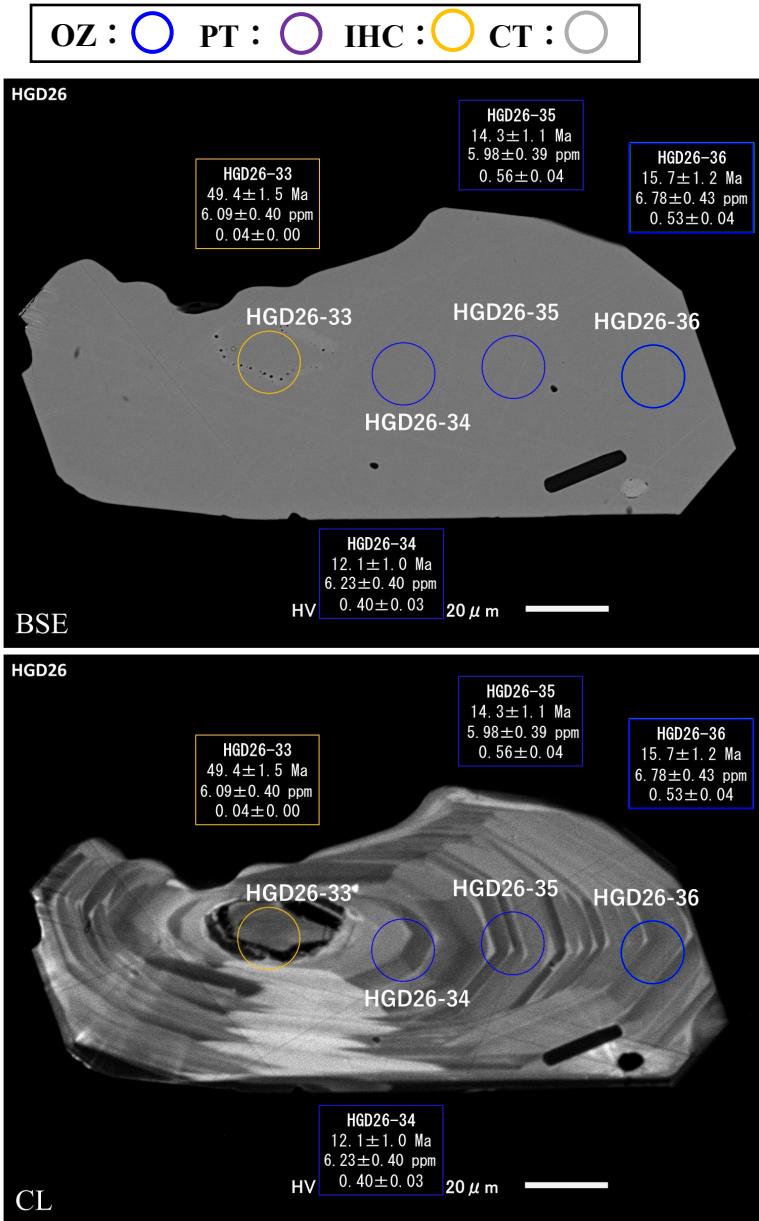
- OZ
- CT

Fig. 84 Zircon data of grain No. HGD25

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio



## Morphological description

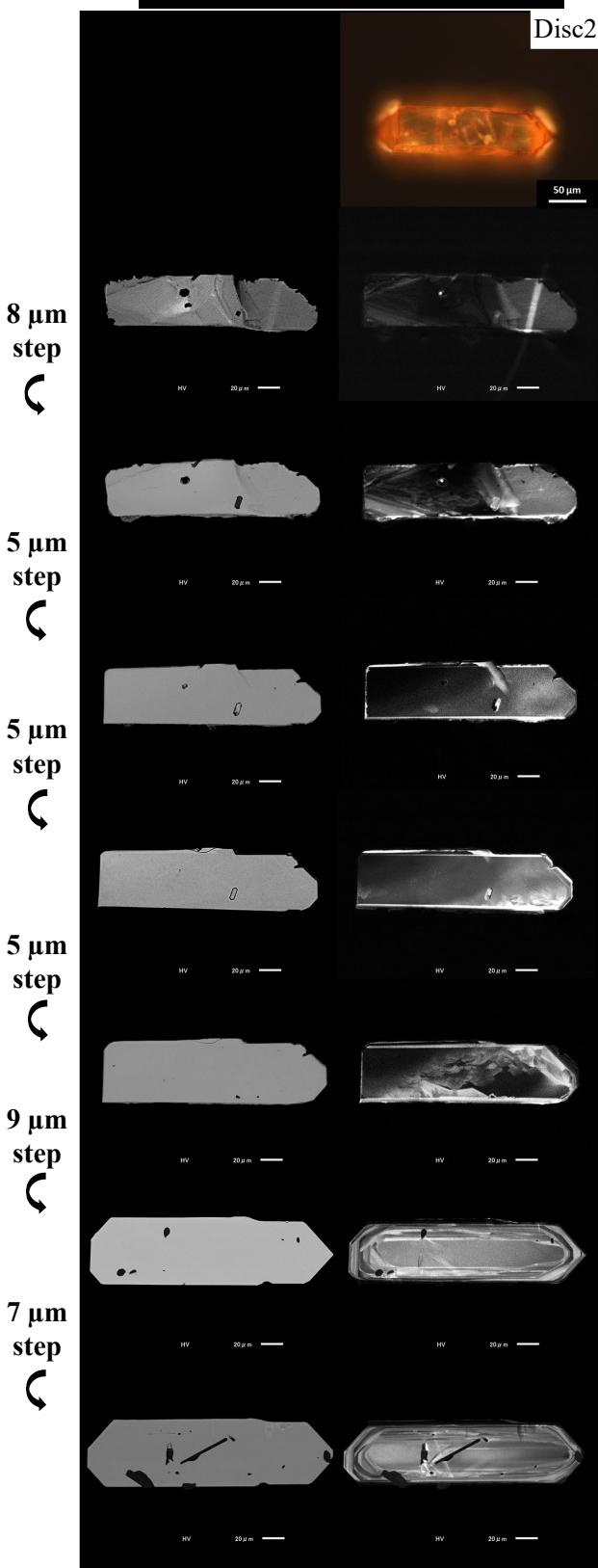
- Type {100}
- Major axis: 174  $\mu\text{m}$
- Minor axis: 68  $\mu\text{m}$
- Major axis/Minor axis: 2.5

## Observed internal texture

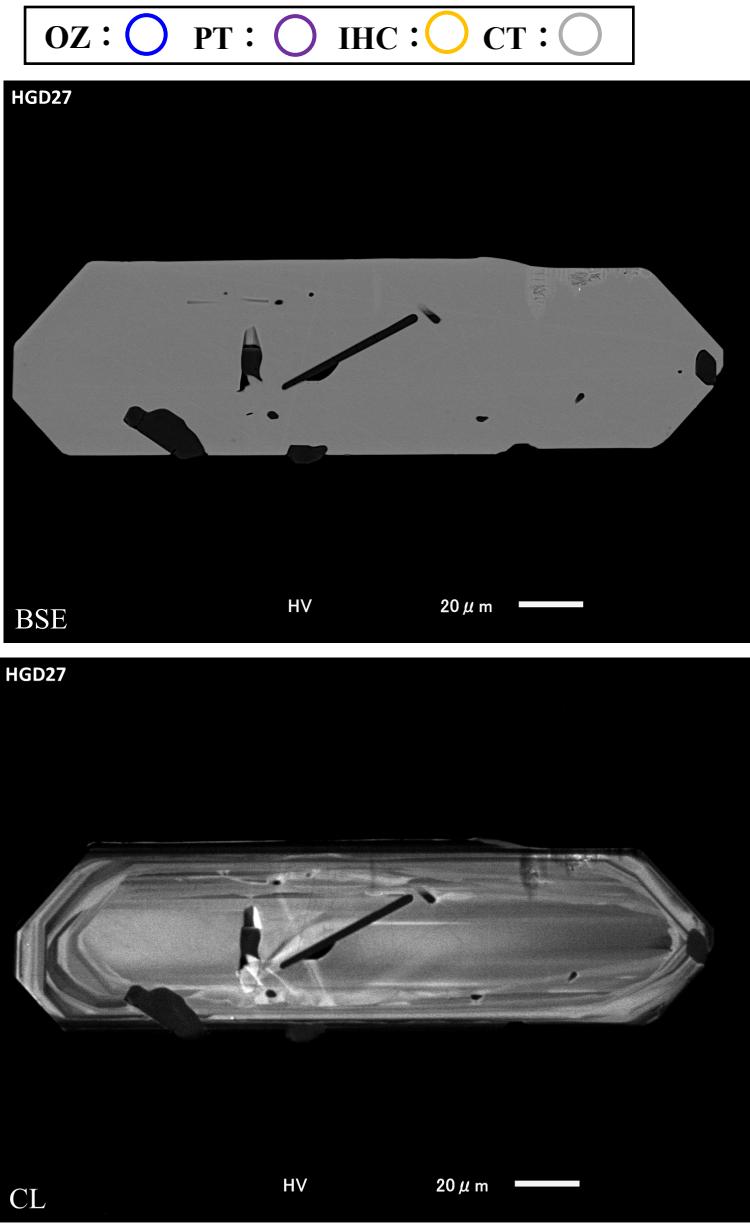
- OZ
- IHC

Fig. 85 Zircon data of grain No. HGD26

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**



**Morphological description**

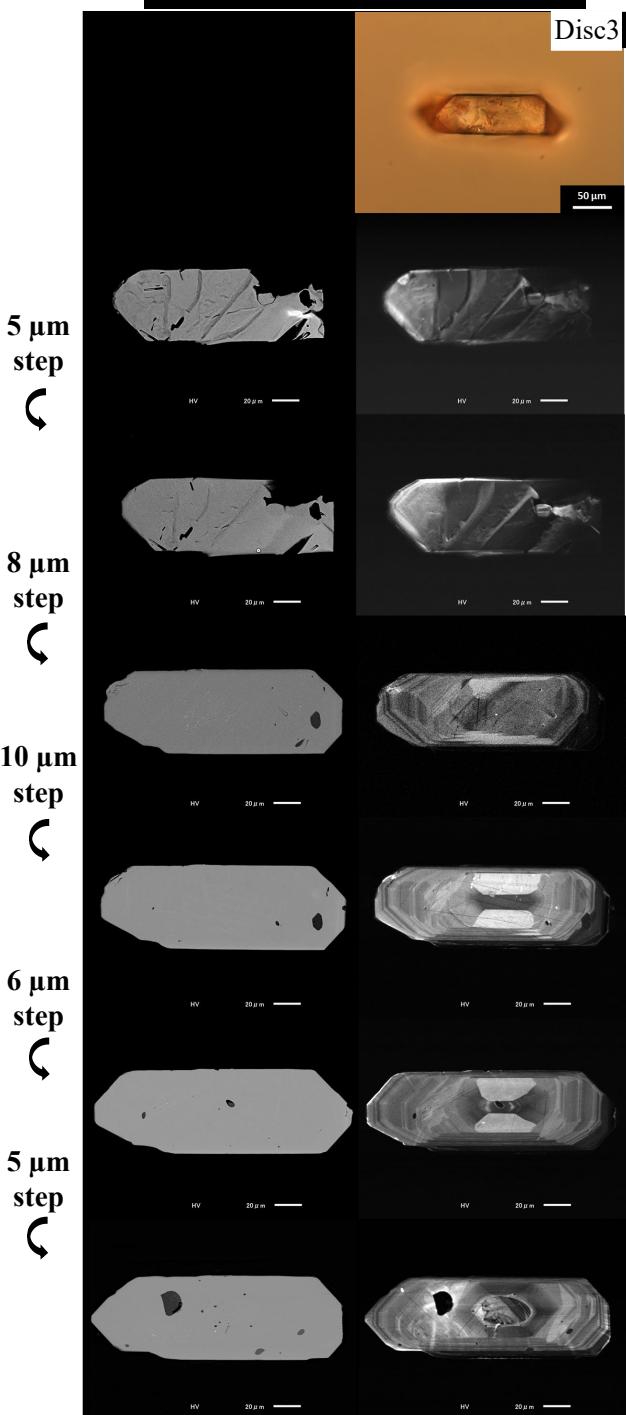
- Type {100}
- Major axis: 226  $\mu\text{m}$
- Minor axis: 62  $\mu\text{m}$
- Major axis/Minor axis: 3.6

**Observed internal texture**

- OZ
- CT
- IHC

Fig. 86 Zircon data of grain No. HGD27

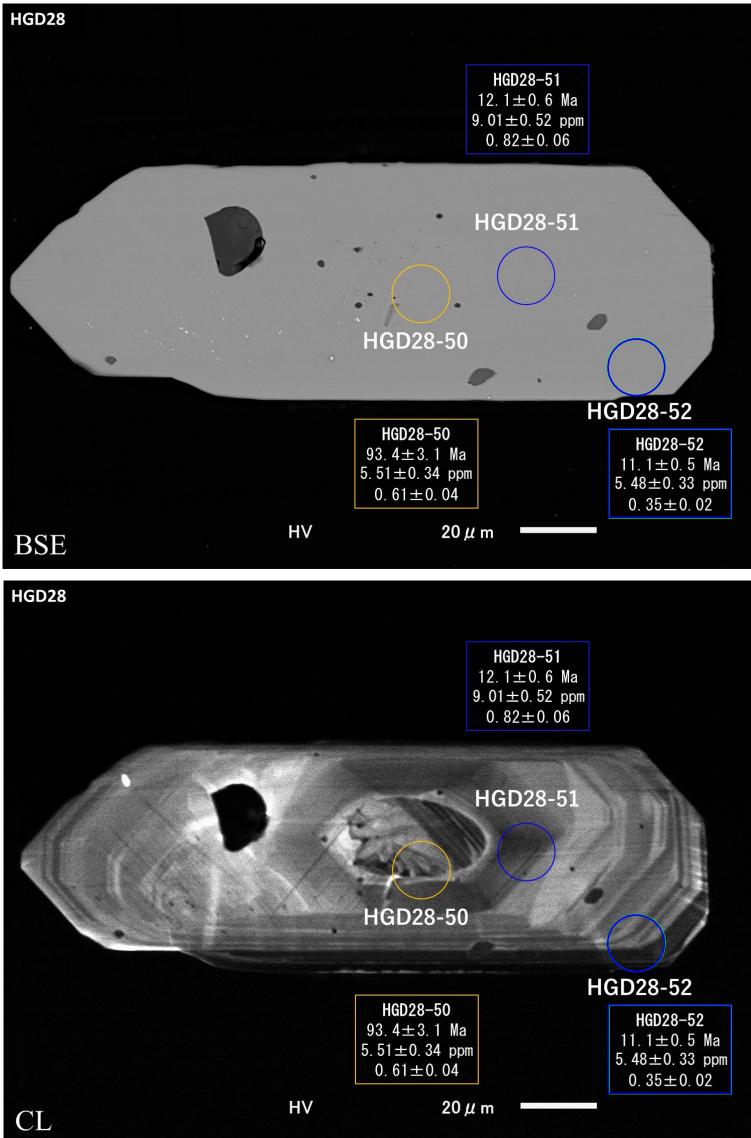
## Morphological observation and CL observation for multi-layers



<Legend>  
OZ: Oscillatory zoning  
PT: Porous texture  
CT: Chaotic texture  
LDT: Local disturbance texture  
IHC: Inherited core

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

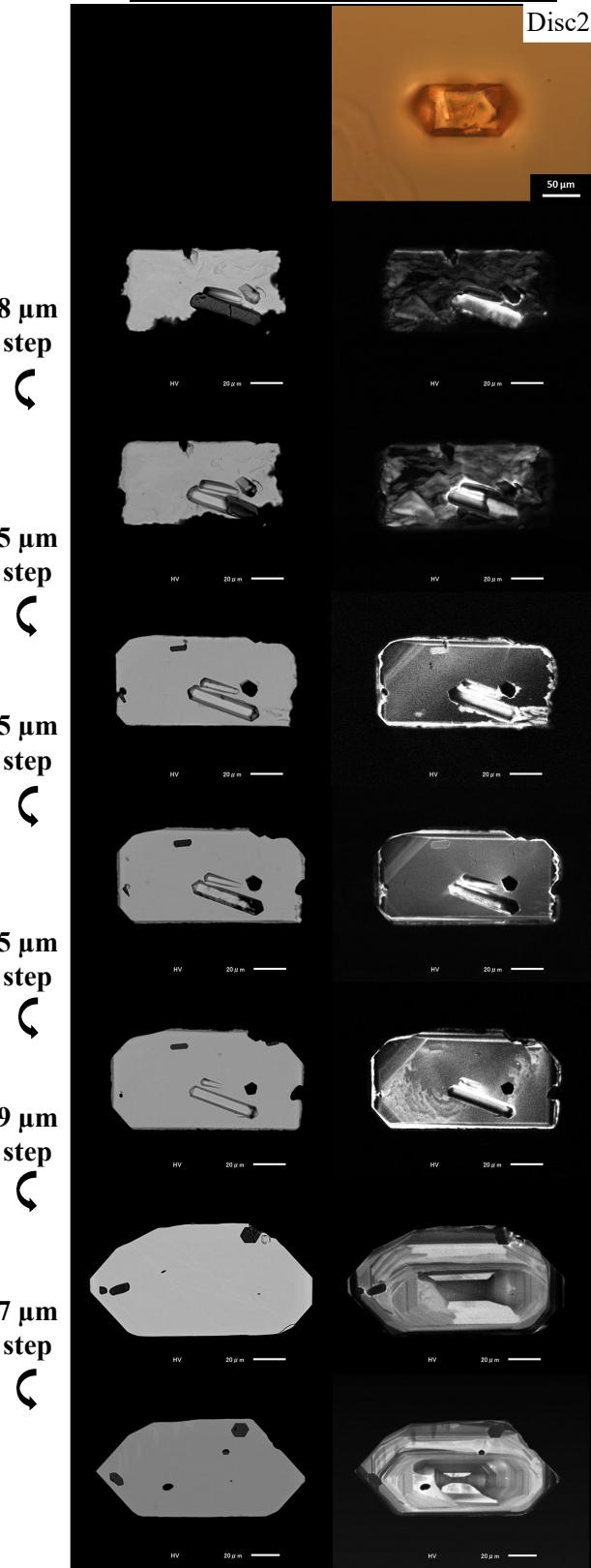
- Type {100}
- Major axis: 194 μm
- Minor axis: 56 μm
- Major axis/Minor axis: 3.4

## Observed internal texture

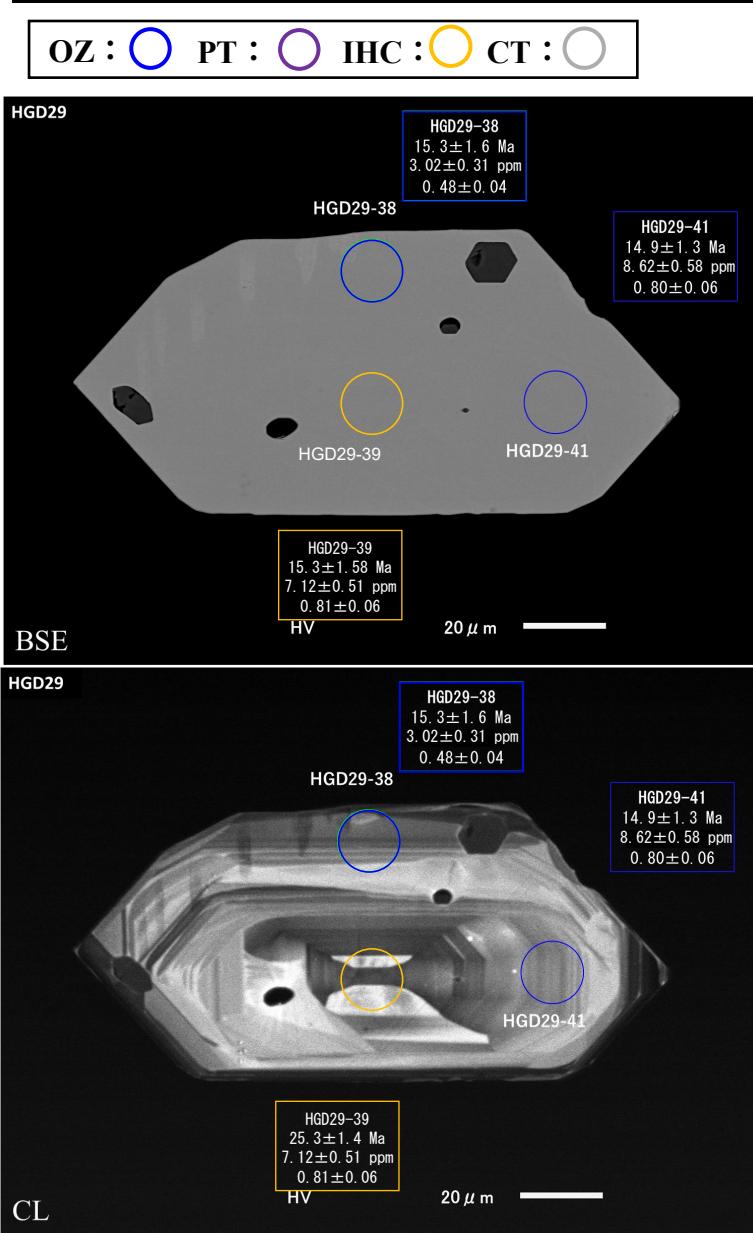
- OZ
- PT
- IHC

Fig. 87 Zircon data of grain No. HGD28

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio



## Morphological description

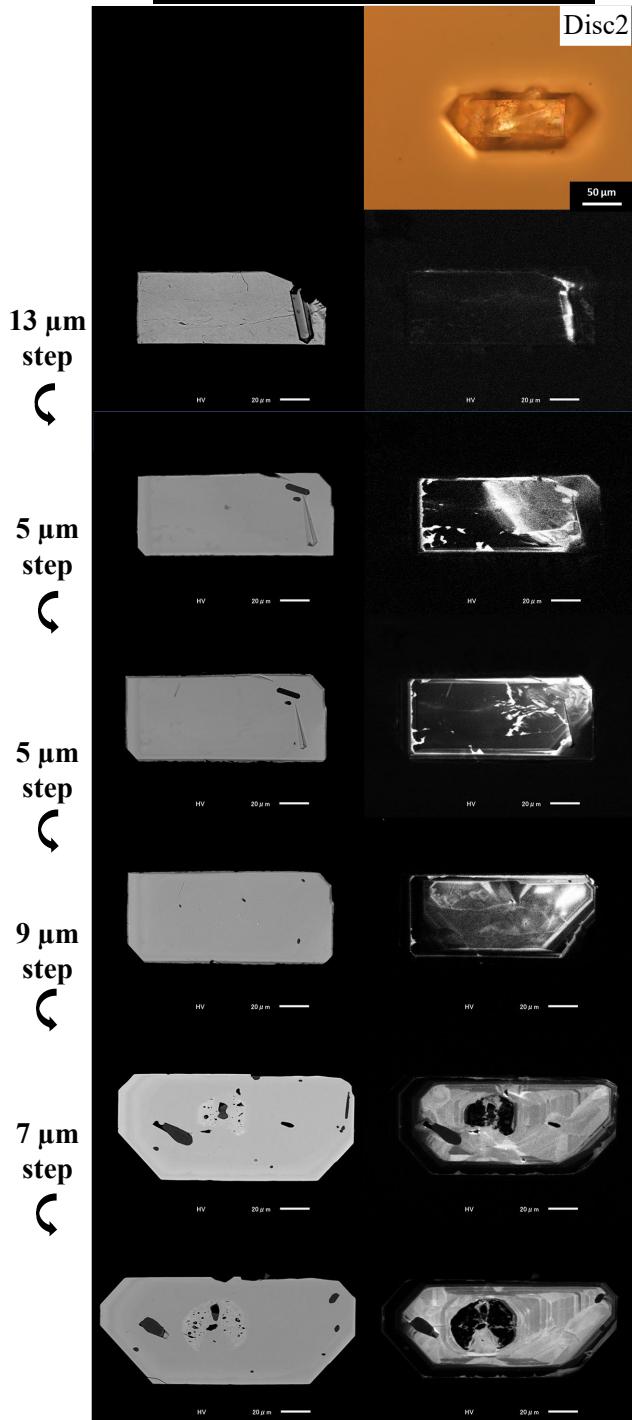
- Type {100}
- Major axis: 142 μm
- Minor axis: 70 μm
- Major axis/Minor axis: 2.0

## Observed internal texture

- OZ
- PT

Fig. 88 Zircon data of grain No. HGD29

## Morphological observation and CL observation for multi-layers

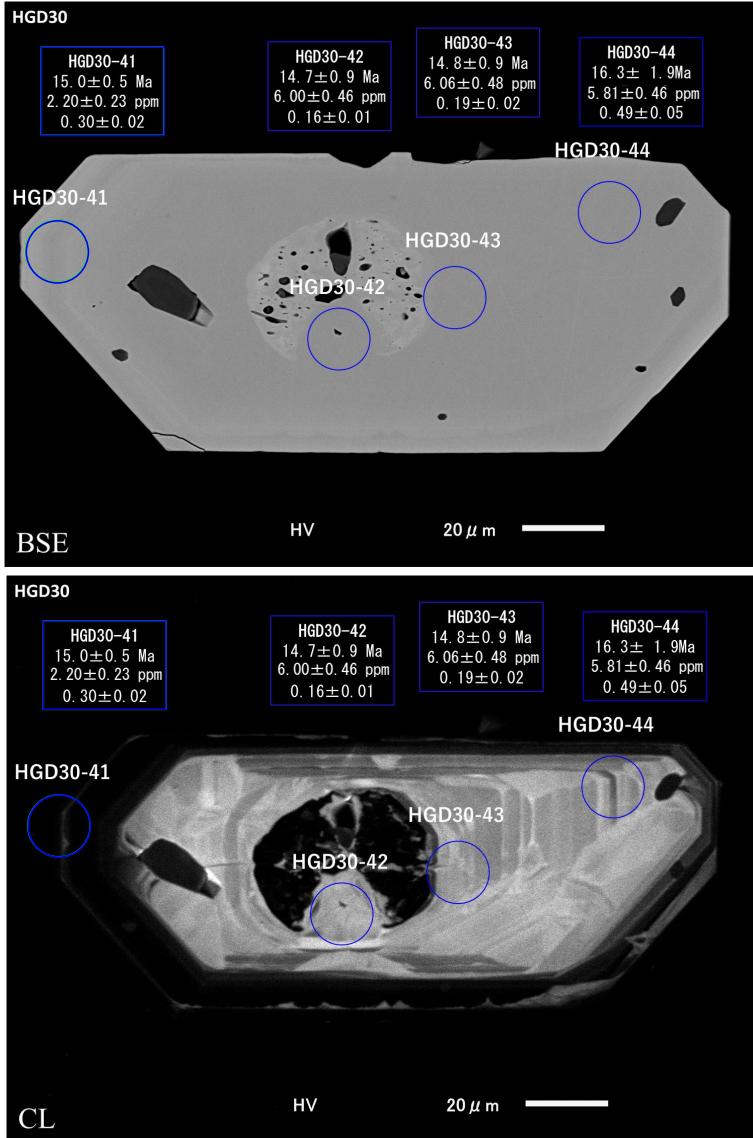


BSE images

CL images

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

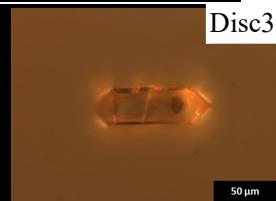
- Type {100}
- Major axis: 187 µm
- Minor axis: 75 µm
- Major axis/Minor axis: 2.5

## Observed internal texture

- OZ
- PT
- CT

Fig. 89 Zircon data of grain No. HGD30

**Morphological observation and CL observation for multi-layers**



5  $\mu\text{m}$   
step



8  $\mu\text{m}$   
step



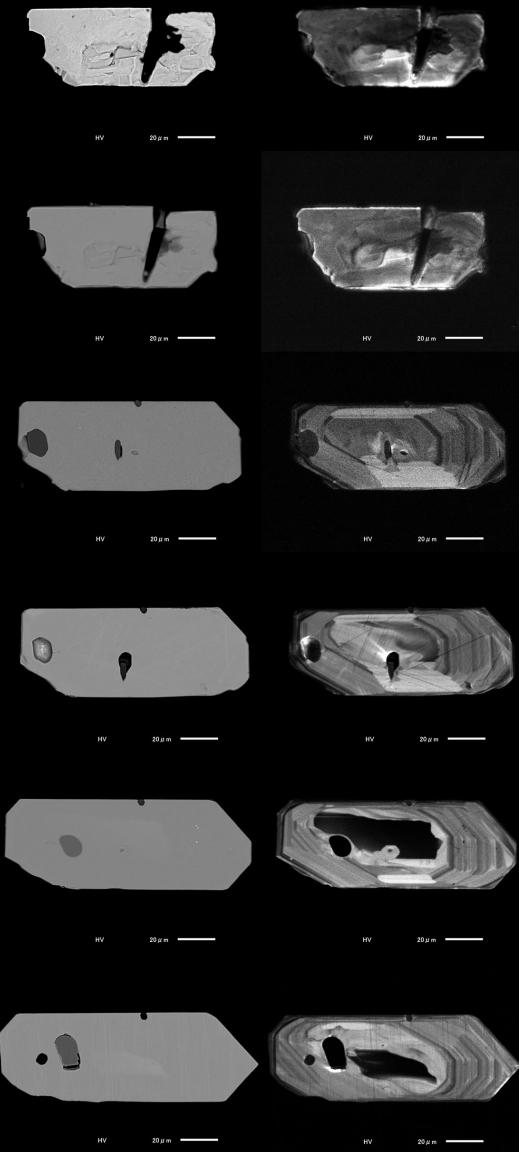
10  $\mu\text{m}$   
step



6  $\mu\text{m}$   
step



5  $\mu\text{m}$   
step



BSE images

CL images

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :

HGD31

BSE

HV

20  $\mu\text{m}$

HGD31

HV

20  $\mu\text{m}$

**Morphological description**

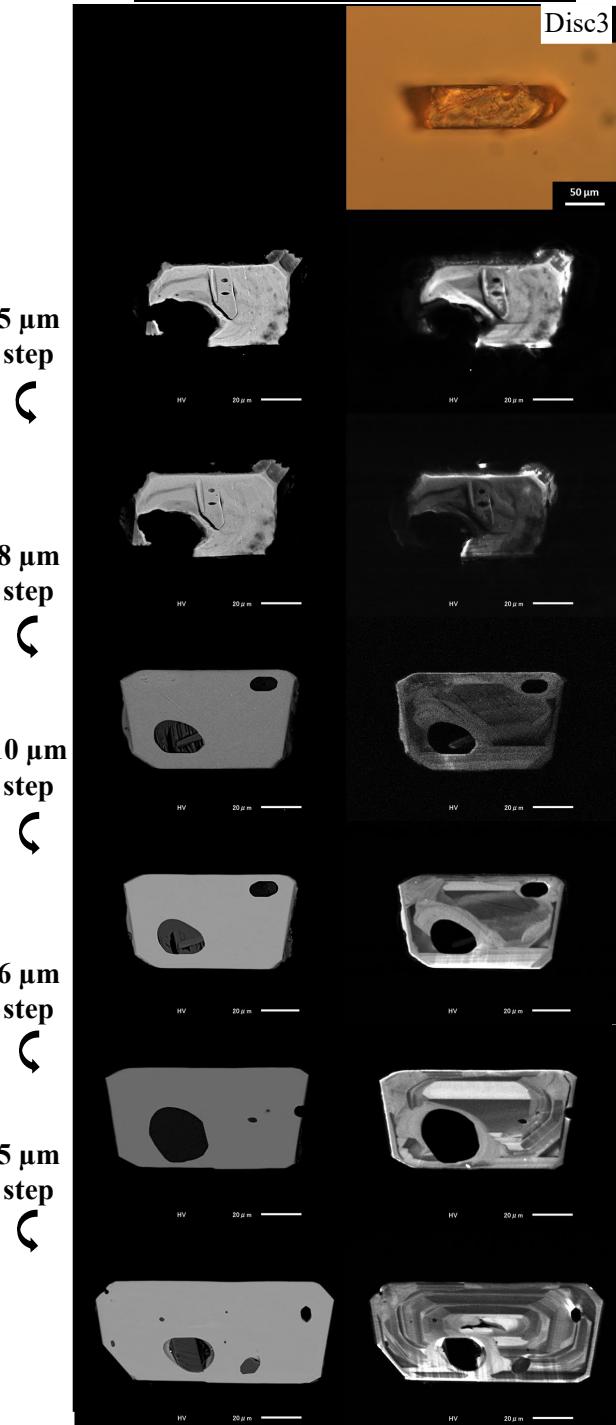
- Type {100}
- Major axis: 148  $\mu\text{m}$
- Minor axis: 48  $\mu\text{m}$
- Major axis/Minor axis: 3.1

**Observed internal texture**

- OZ
- PT

Fig. 90 Zircon data of grain No. HGD31

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

<Legend>

OZ: Oscillatory zoning

PT: Porous texture

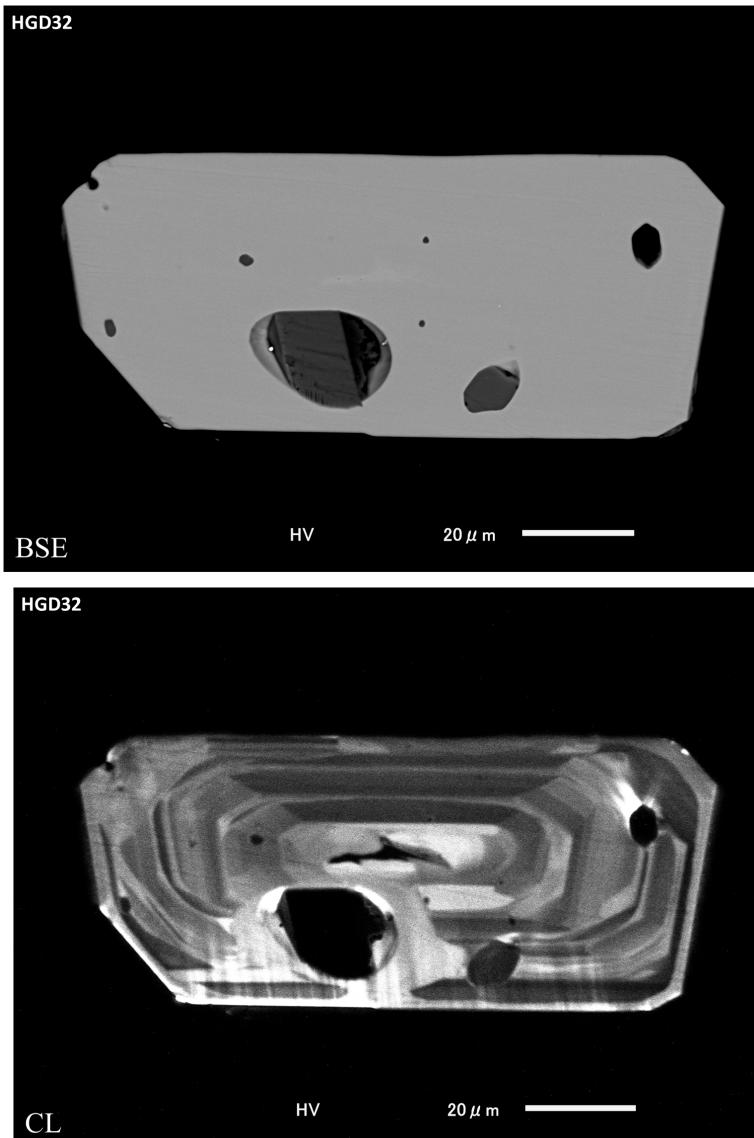
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

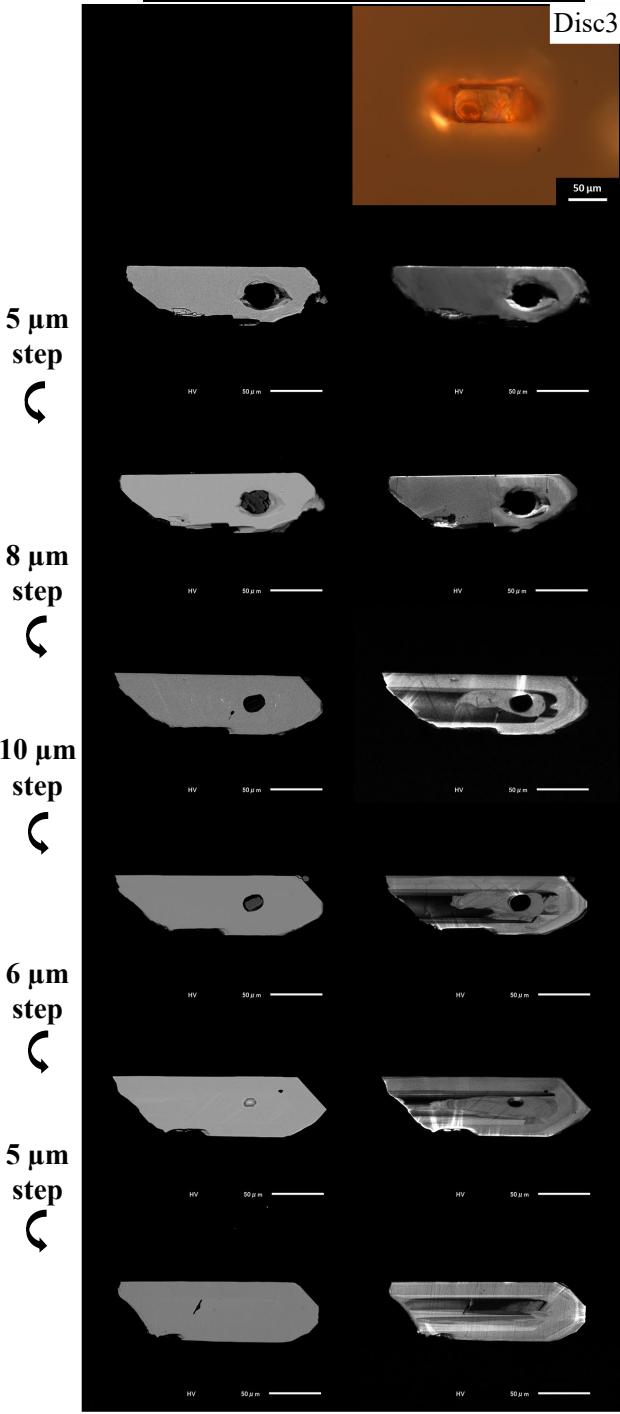
- Type –not classified
- Major axis: 207 μm
- Minor axis: 57 μm
- Major axis/Minor axis: 3.6

**Observed internal texture**

- OZ
- PT

Fig. 91 Zircon data of grain No. HGD32

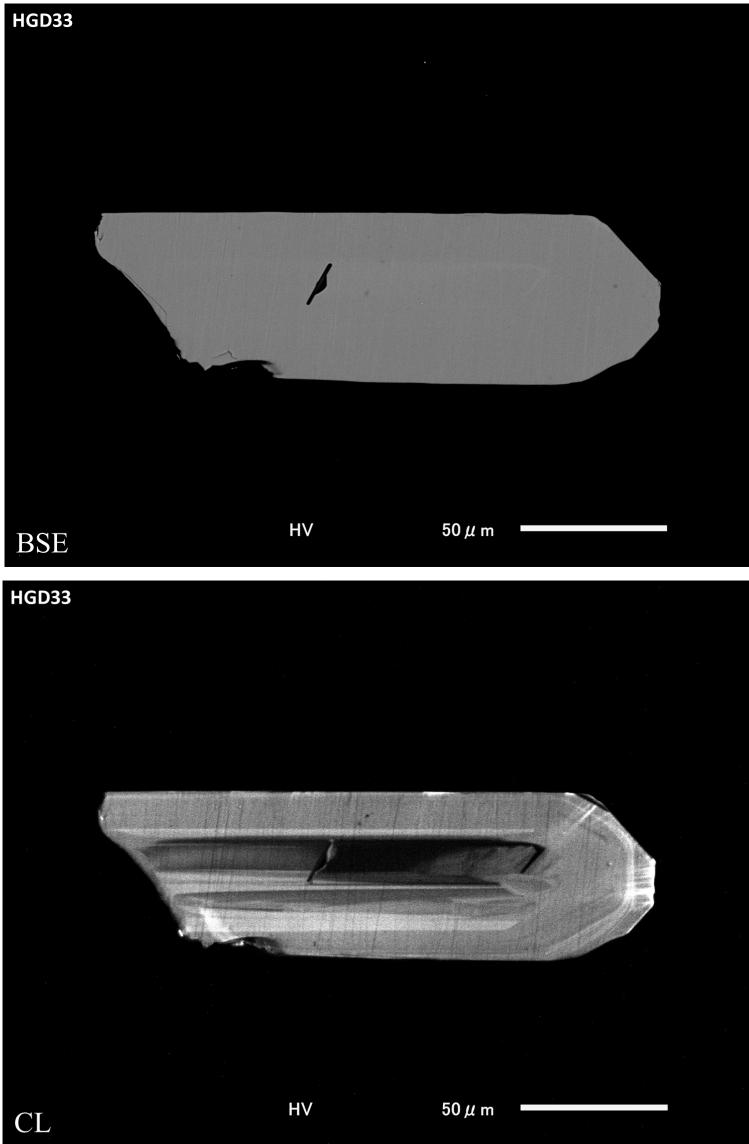
**Morphological observation and CL observation for multi-layers**



<Legend>  
OZ: Oscillatory zoning  
PT: Porous texture  
CT: Chaotic texture  
LDT: Local disturbance texture  
IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

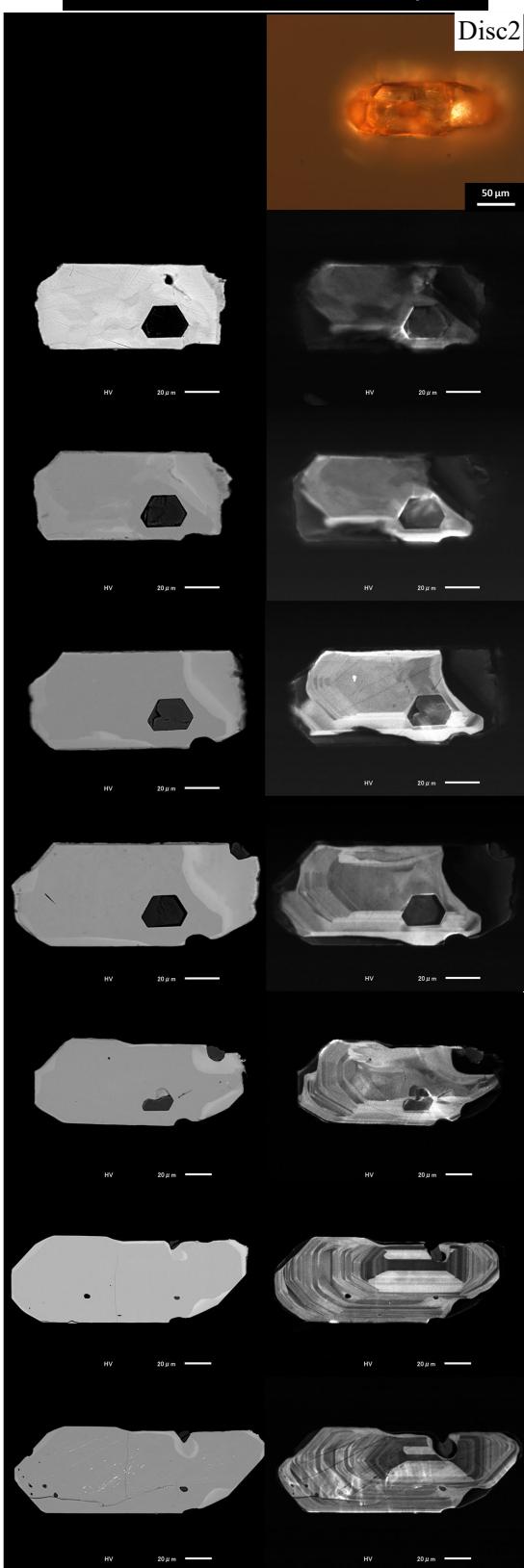
- Type –not classified
- Major axis: 134  $\mu\text{m}$
- Minor axis: 51  $\mu\text{m}$
- Major axis/Minor axis: 2.6

**Observed internal texture**

- OZ
- PT

Fig. 92 Zircon data of grain No. HGD33

## Morphological observation and CL observation for multi-layers

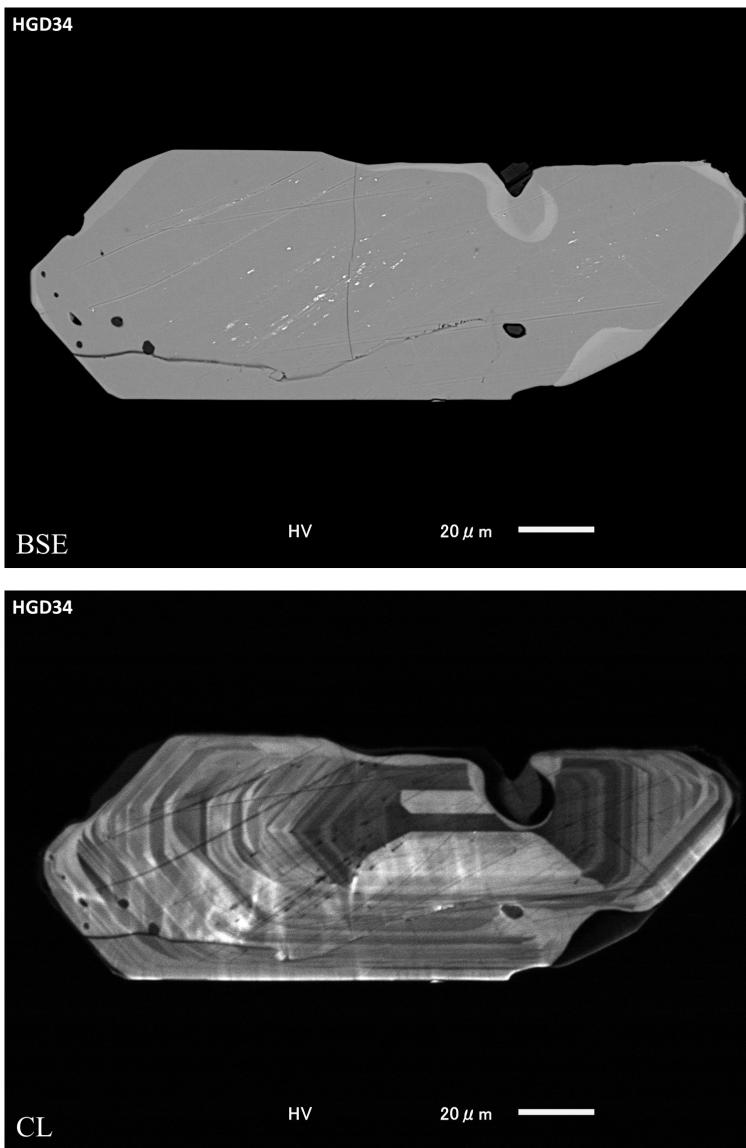


## BSE images

CL images

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ :  PT :  IHC :  CT :



## Morphological description

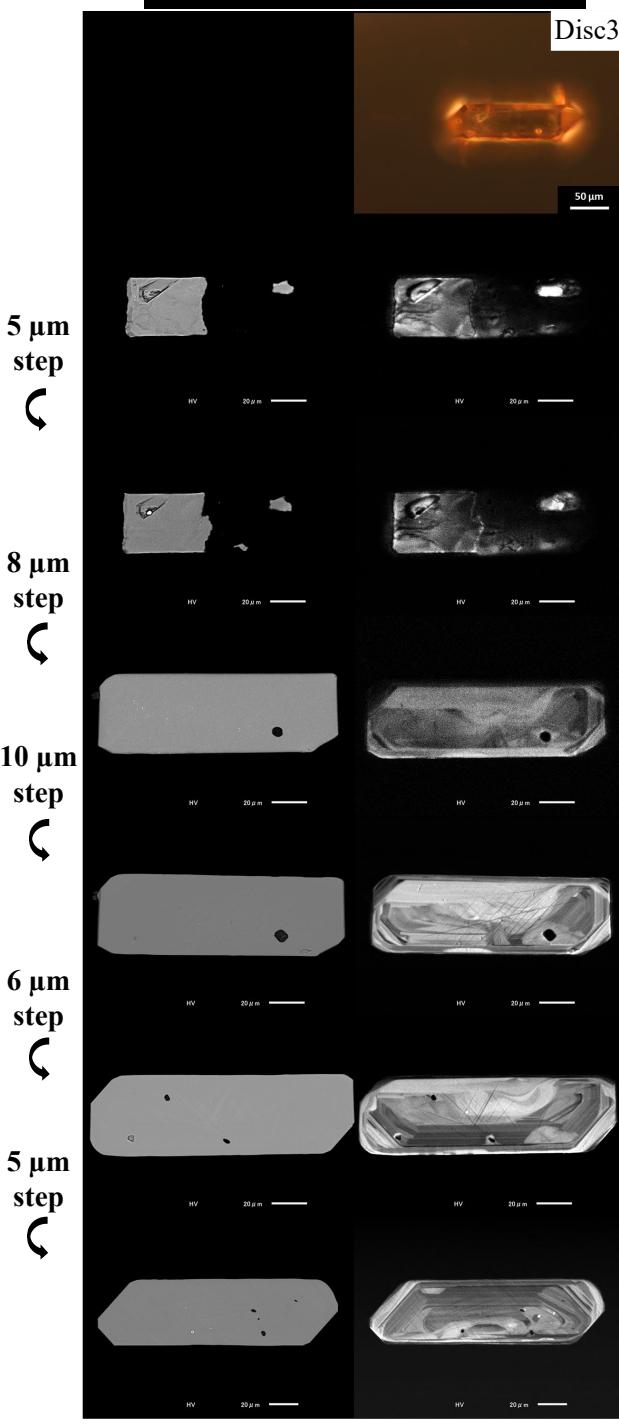
- Type {100}
  - Major axis: 190  $\mu\text{m}$
  - Minor axis: 71  $\mu\text{m}$
  - Major axis/Minor axis: 2.7

## **Observed internal texture**

- OZ
  - PT

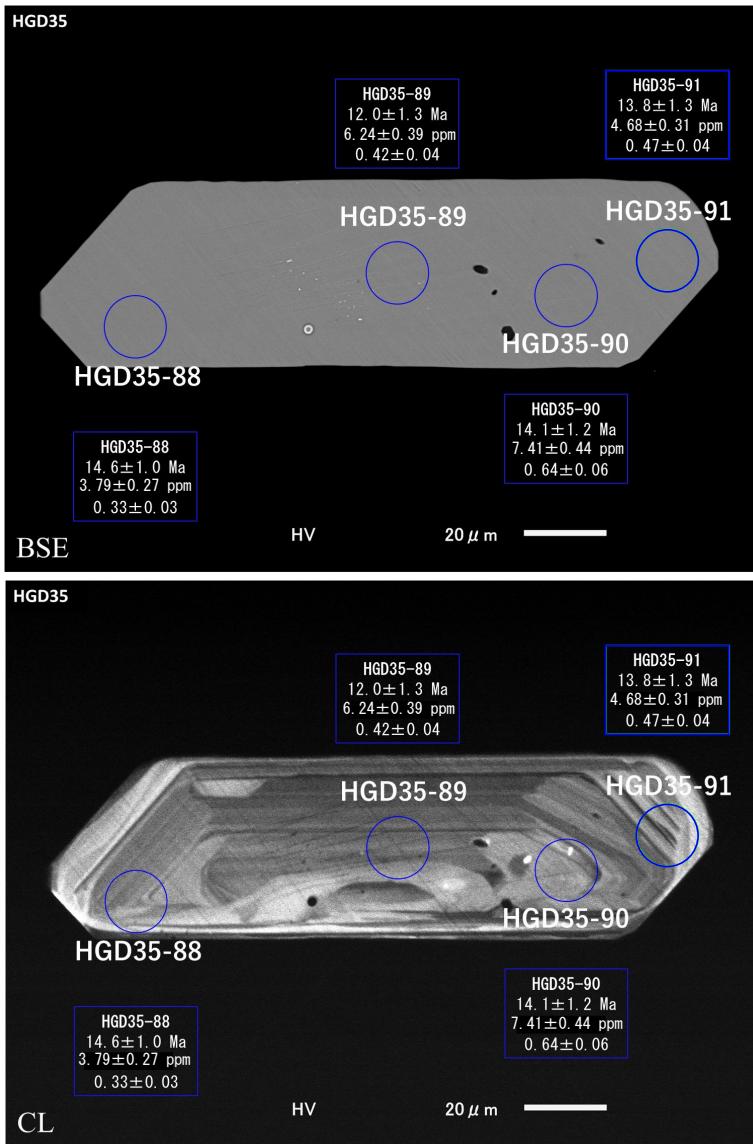
Fig. 93 Zircon data of grain No. HGD34

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

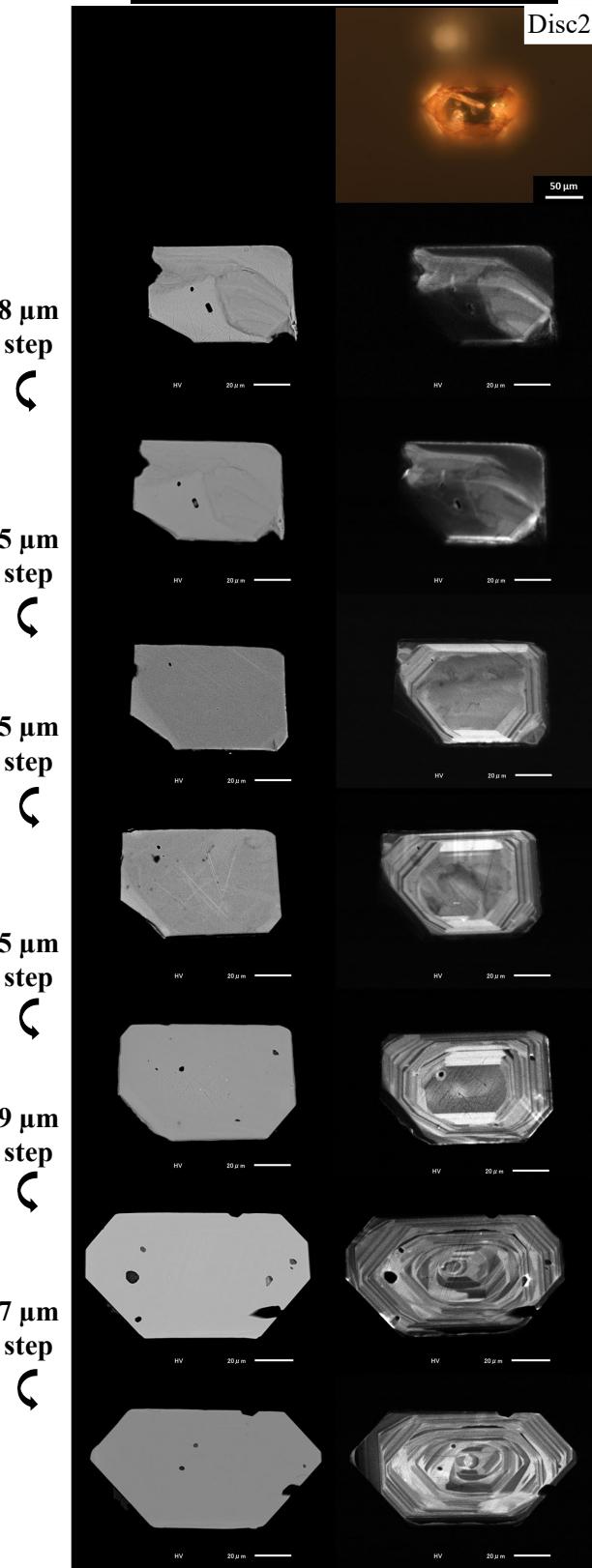
- Type {100}
- Major axis:  $165 \mu\text{m}$
- Minor axis:  $47 \mu\text{m}$
- Major axis/Minor axis: 3.5

## Observed internal texture

- OZ
- PT

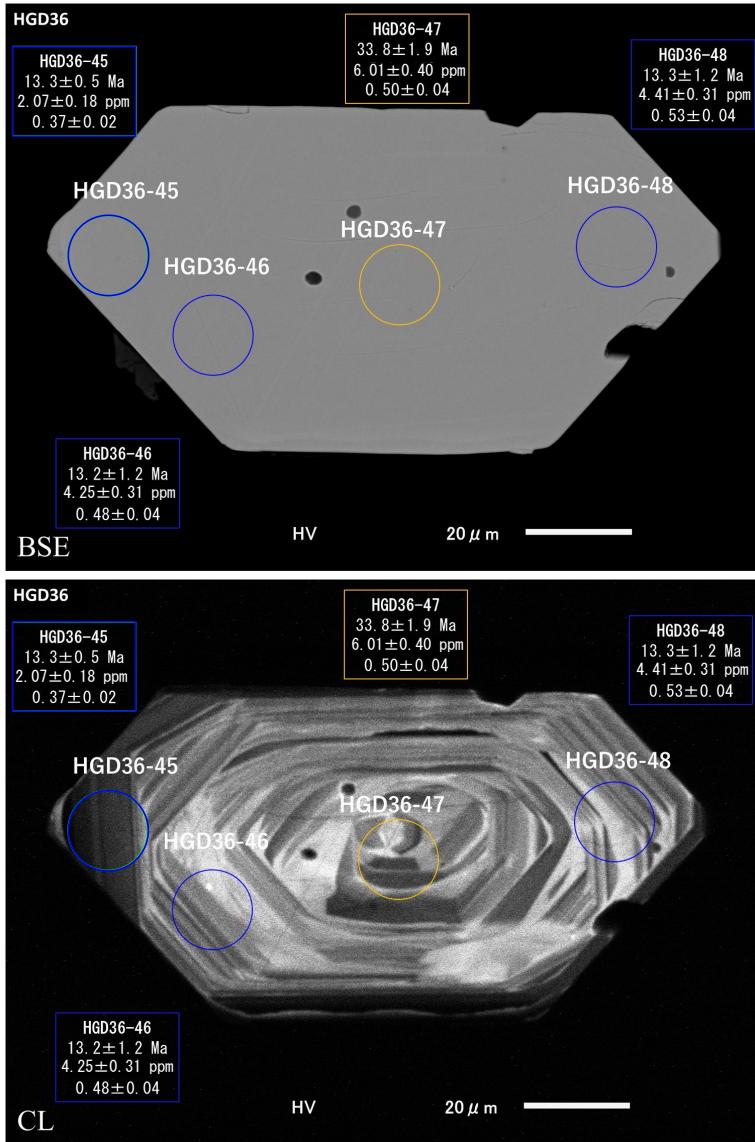
Fig. 94 Zircon data of grain No. HGD35

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

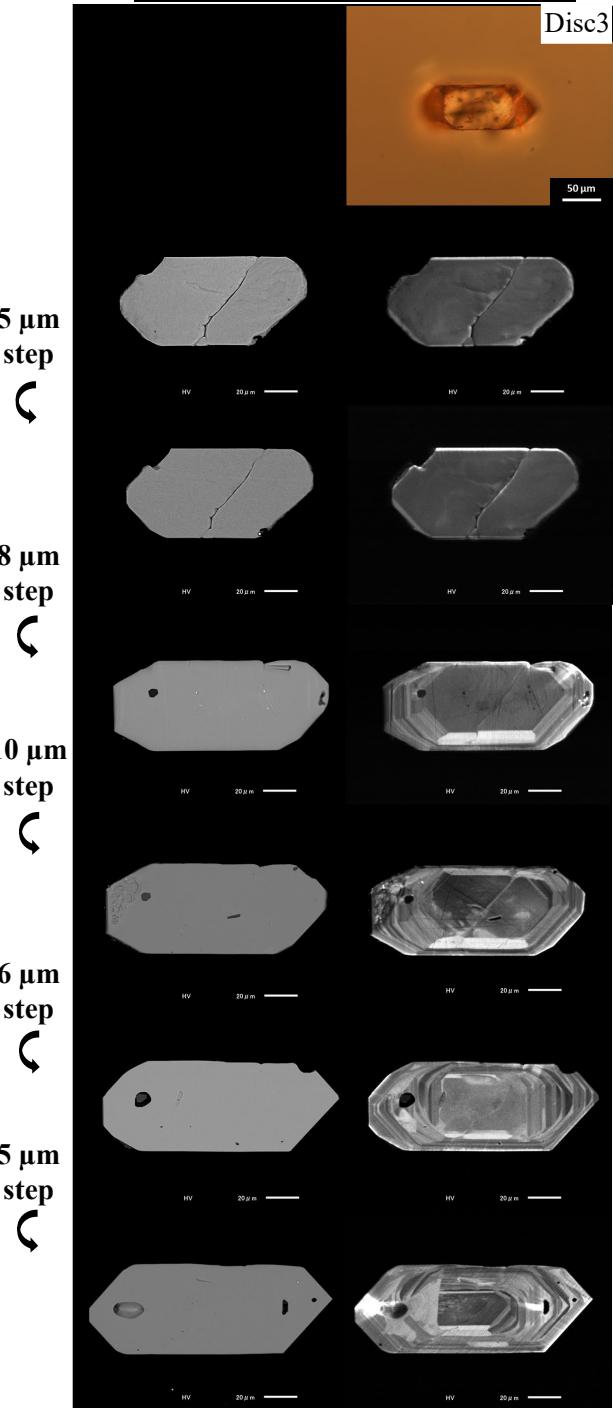
- Type {100}
- Major axis: 124 μm
- Minor axis: 65 μm
- Major axis/Minor axis: 1.9

## Observed internal texture

- OZ
- PT
- IHC

Fig. 95 Zircon data of grain No. HGD36

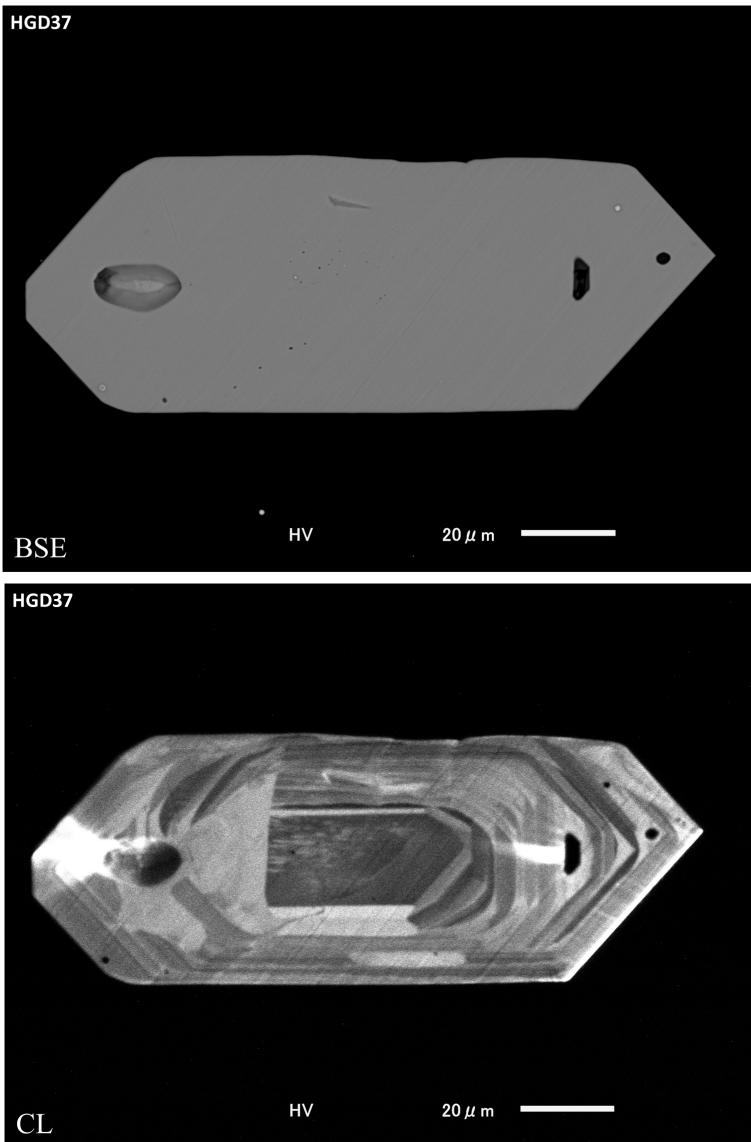
**Morphological observation and CL observation for multi-layers**



<Legend>  
 OZ: Oscillatory zoning  
 PT: Porous texture  
 CT: Chaotic texture  
 LDT: Local disturbance texture  
 IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

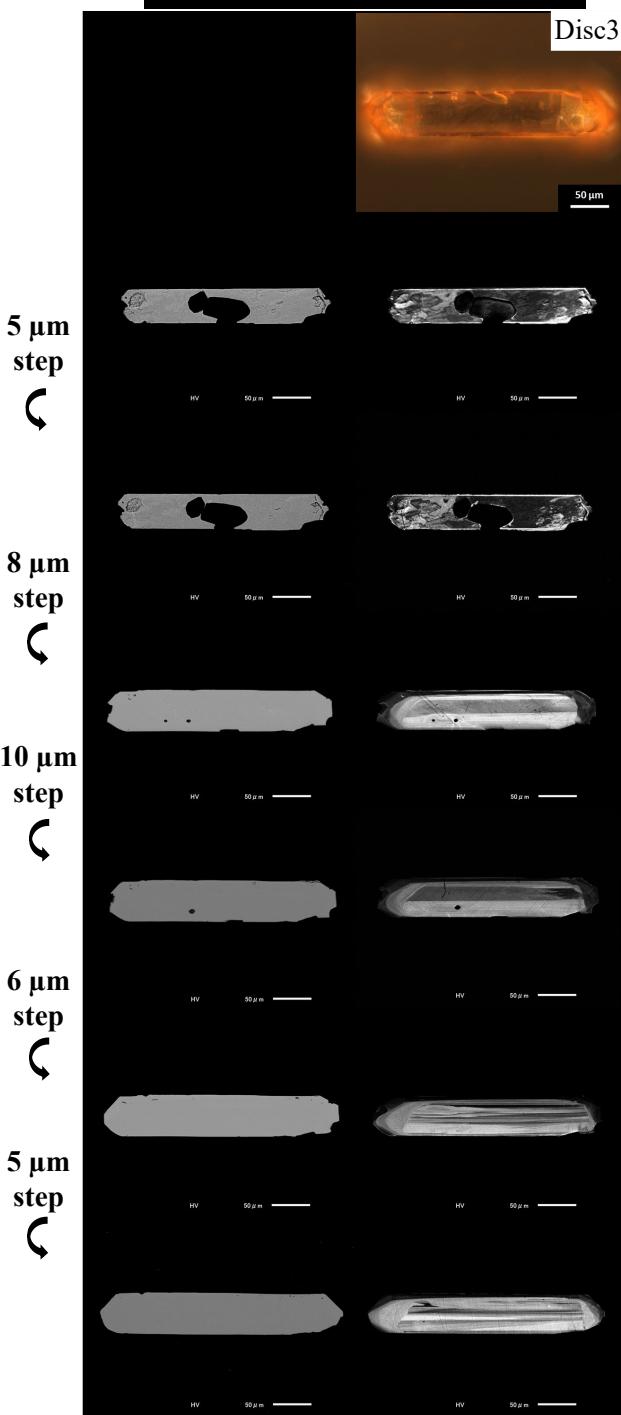
- Type {100}
- Major axis: 148 μm
- Minor axis: 59 μm
- Major axis/Minor axis: 2.5

**Observed internal texture**

- OZ
- PT

Fig. 96 Zircon data of grain No. HGD37

## Morphological observation and CL observation for multi-layers



<Legend>

OZ: Oscillatory zoning

PT: Porous texture

CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :

HGD38

HGD38-54

HGD38-54  
12.2±1.2 Ma  
10.86±0.62 ppm  
0.81±0.07

HGD38-54

HGD38-56  
11.7±1.7 Ma  
12.19±0.69 ppm  
0.51±0.06

HGD38-56

HGD38-53

HGD38-53  
12.0±1.4 Ma  
11.38±0.63 ppm  
0.30±0.03

HGD38-55

HGD38-55  
11.4±1.2 Ma  
13.78±0.78 ppm  
0.79±0.07

BSE

HV

50 μ m

HGD38

HGD38-54  
12.2±1.2 Ma  
10.86±0.62 ppm  
0.81±0.07

HGD38-54

HGD38-56  
11.7±1.7 Ma  
12.19±0.69 ppm  
0.51±0.06

HGD38-56

HGD38-53

HGD38-53  
12.0±1.4 Ma  
11.38±0.63 ppm  
0.30±0.03

HGD38-55

HGD38-55  
11.4±1.2 Ma  
13.78±0.78 ppm  
0.79±0.07

CL

HV

50 μ m

## Morphological description

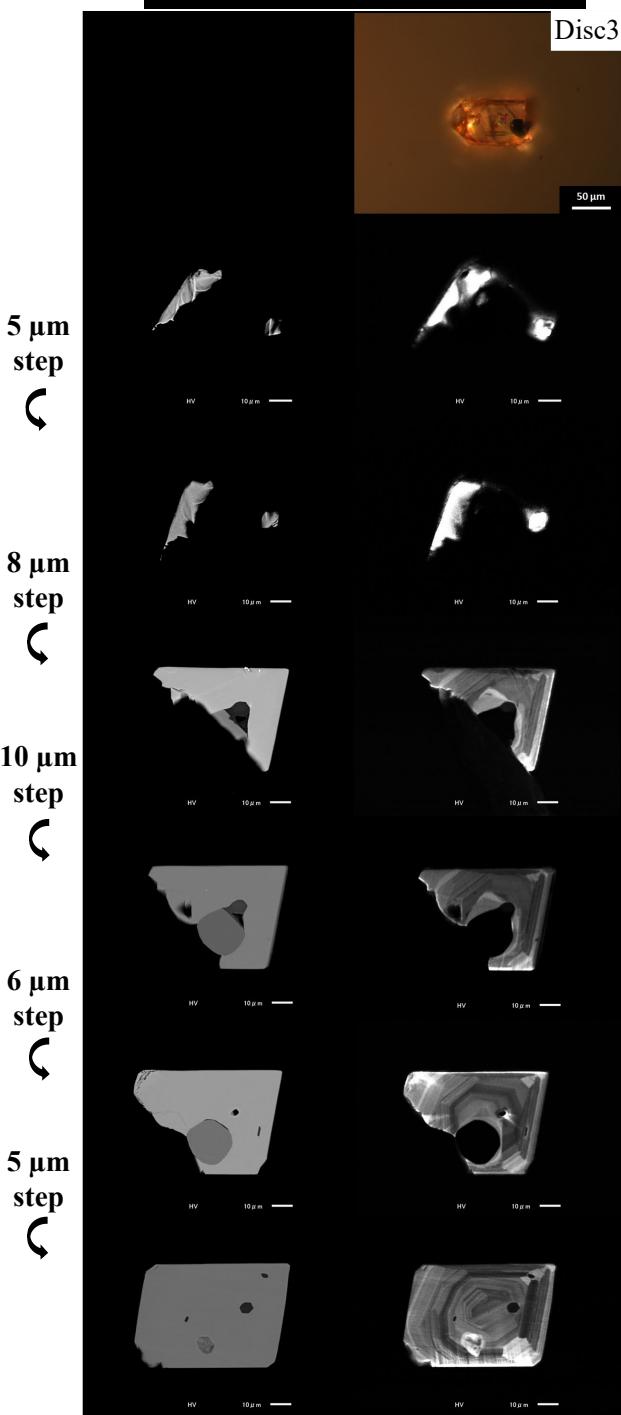
- Type –not classified
- Major axis: 316 μm
- Minor axis: 59 μm
- Major axis/Minor axis: 5.4

## Observed internal texture

- OZ
- PT
- CT

Fig. 97 Zircon data of grain No. HGD38

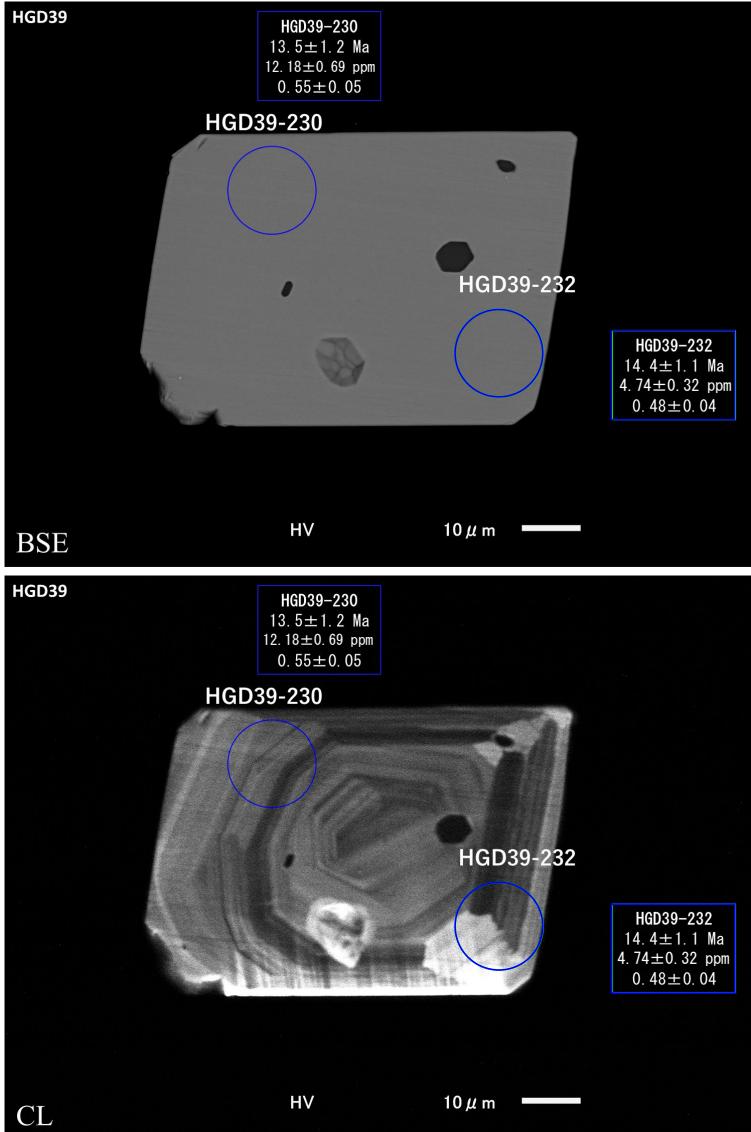
## Morphological observation and CL observation for multi-layers



<Legend>  
 OZ: Oscillatory zoning  
 PT: Porous texture  
 CT: Chaotic texture  
 LDT: Local disturbance texture  
 IHC: Inherited core

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :



## Morphological description

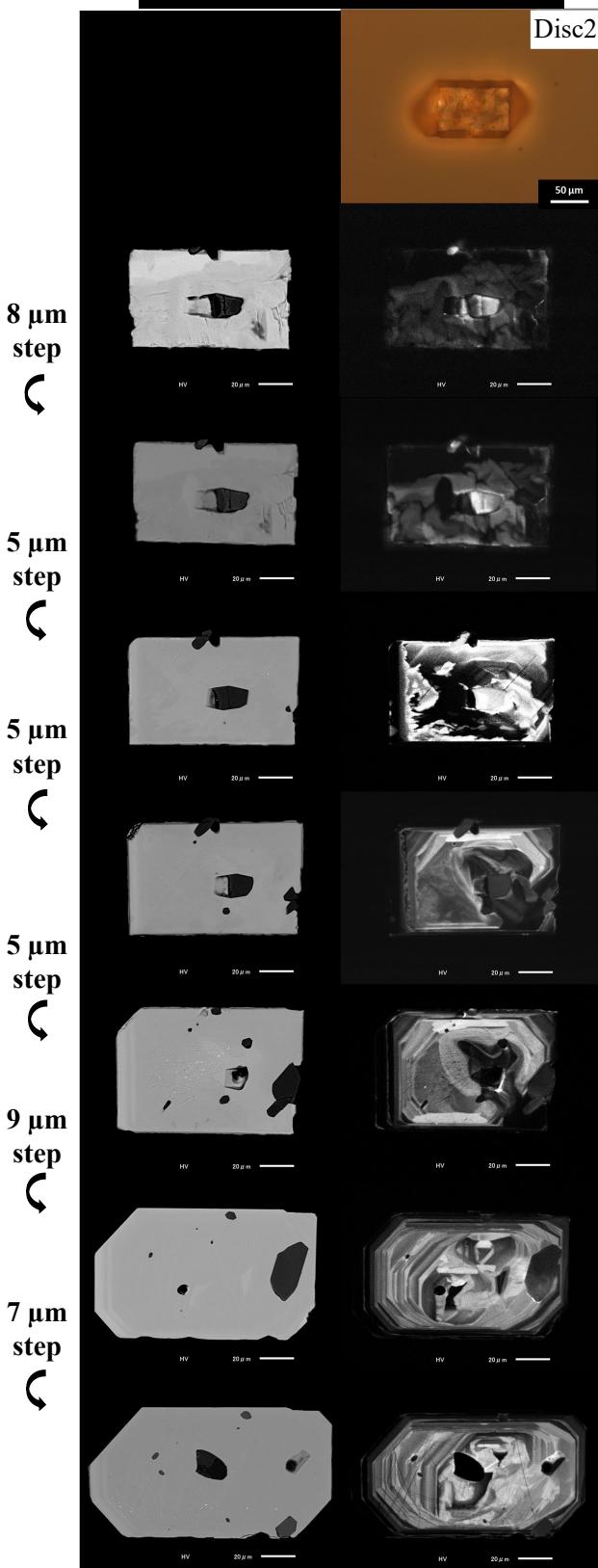
- Type {100}
- Major axis: 105  $\mu$ m
- Minor axis: 60  $\mu$ m
- Major axis/Minor axis: 1.8

## Observed internal texture

- OZ
- PT

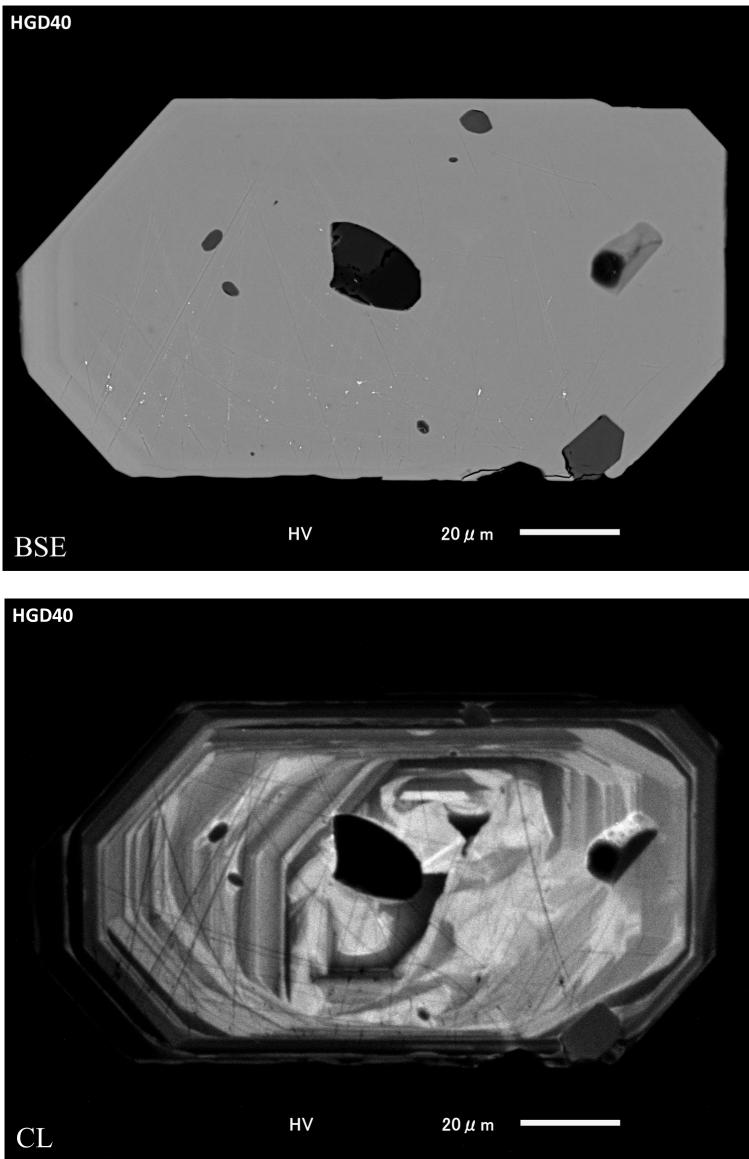
Fig. 98 Zircon data of grain No. HGD39

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

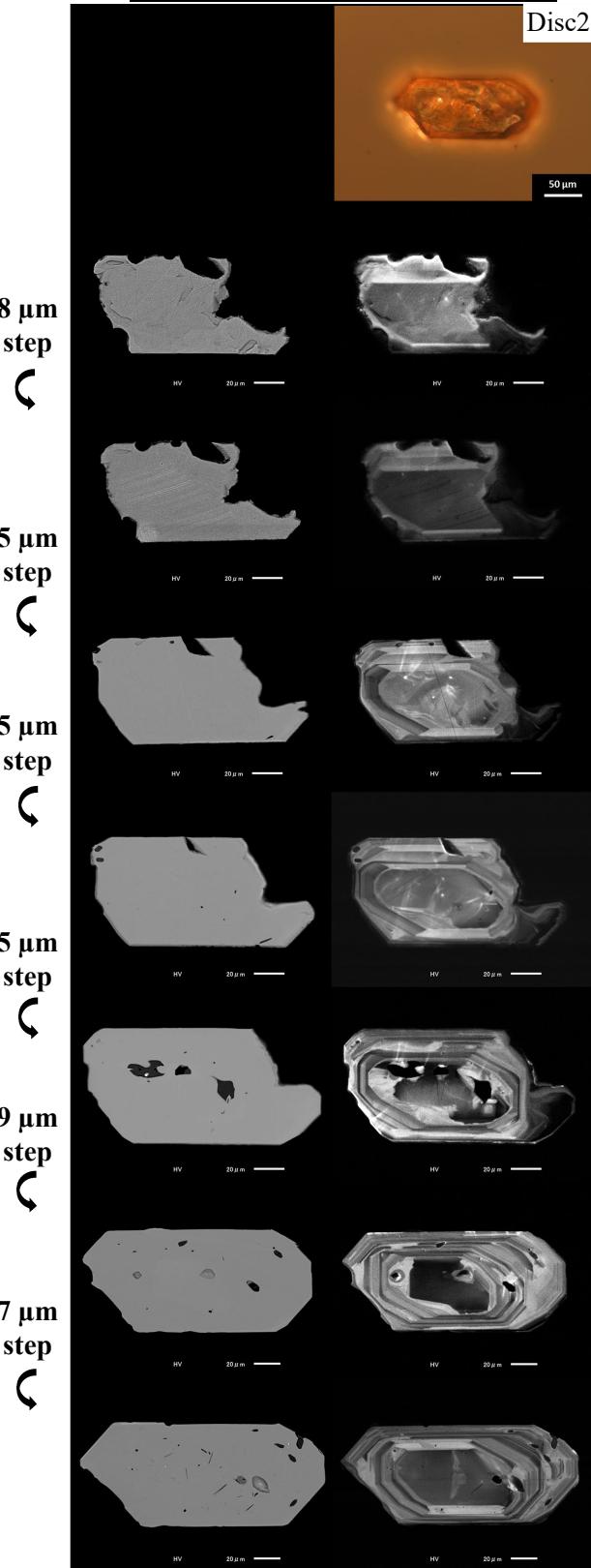
- Type {100}
- Major axis: 154  $\mu\text{m}$
- Minor axis: 78  $\mu\text{m}$
- Major axis/Minor axis: 2.0

**Observed internal texture**

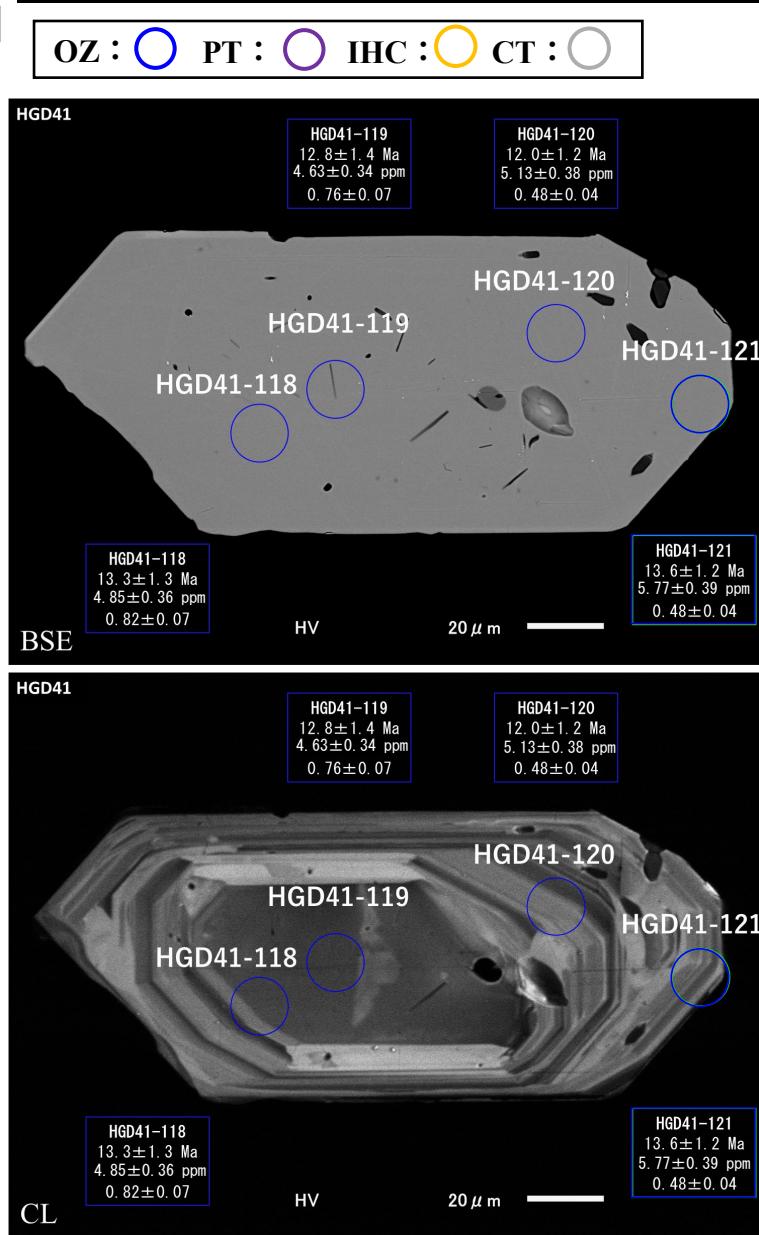
- OZ
- PT
- CT

Fig. 99 Zircon data of grain No. HGD40

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**



**Morphological description**

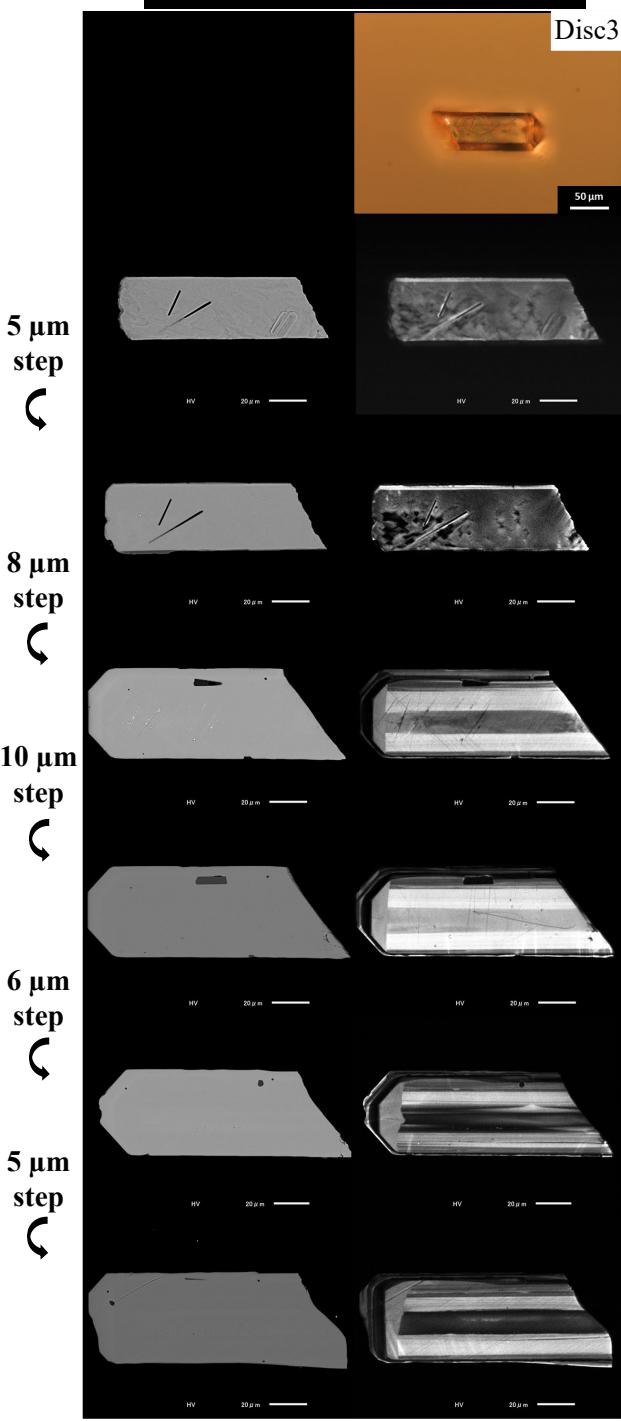
- Type –not classified
- Major axis: 183  $\mu\text{m}$
- Minor axis: 76  $\mu\text{m}$
- Major axis/Minor axis: 2.4

**Observed internal texture**

- OZ
- PT

Fig. 100 Zircon data of grain No. HGD41

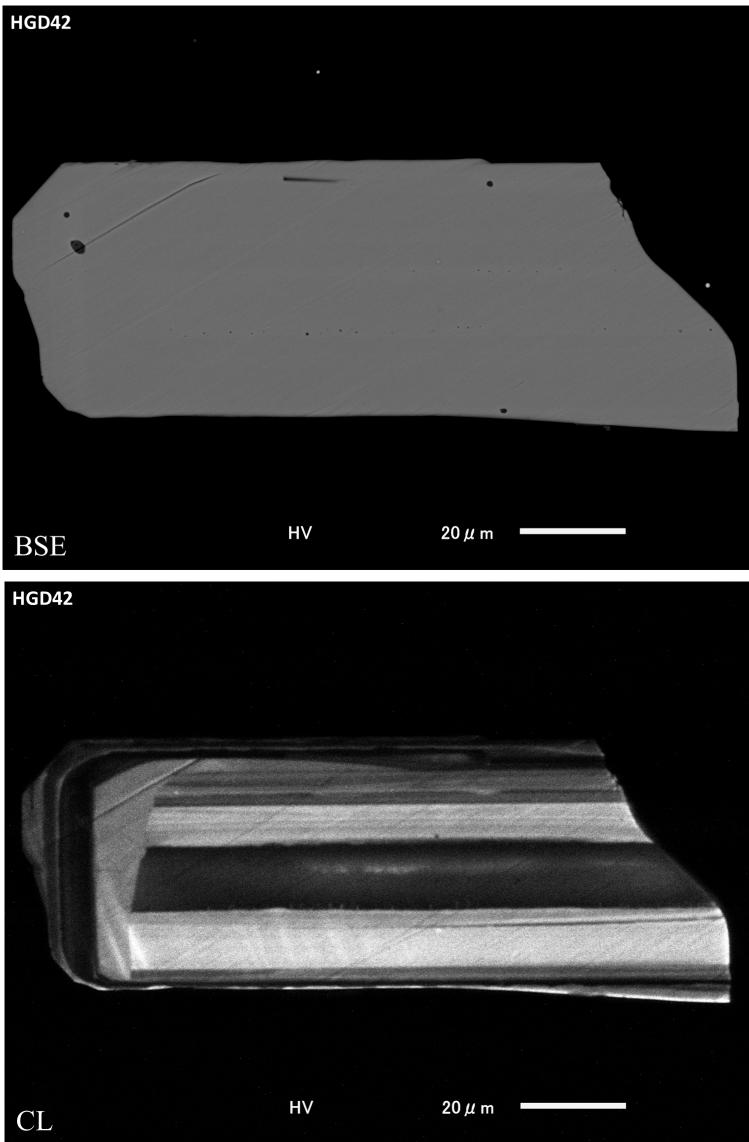
**Morphological observation and CL observation for multi-layers**



<Legend>  
OZ: Oscillatory zoning  
PT: Porous texture  
CT: Chaotic texture  
LDT: Local disturbance texture  
IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

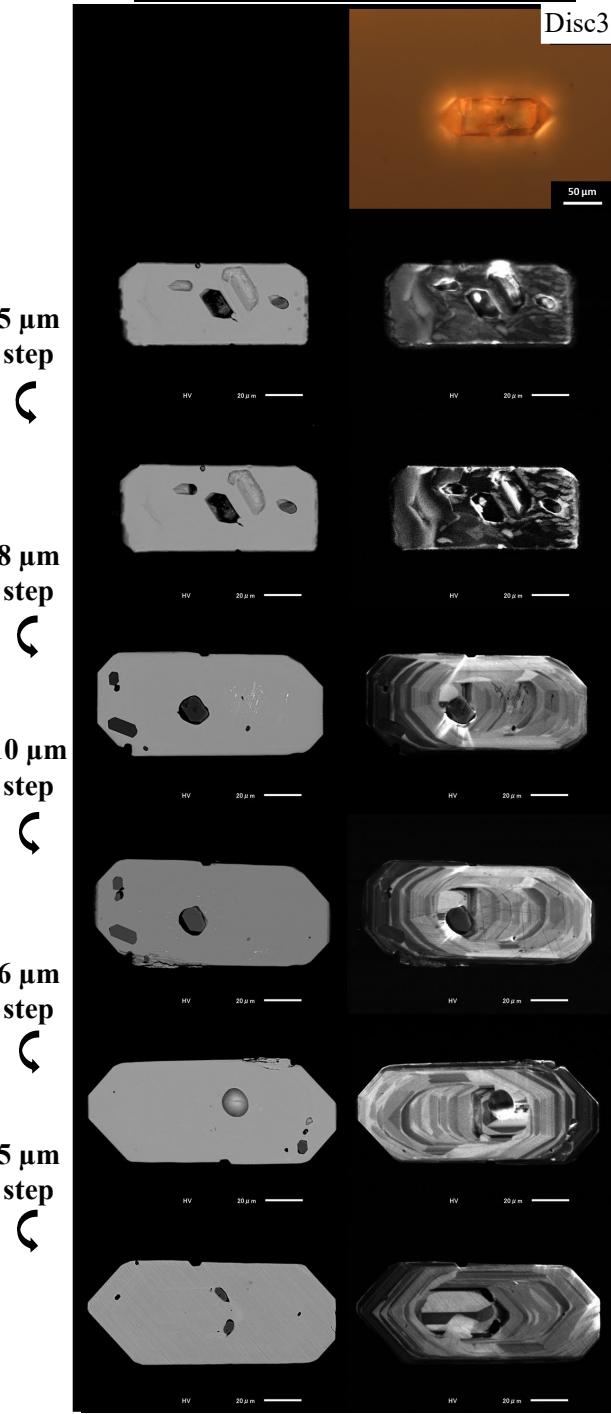
- Type {100}
- Major axis: 144  $\mu\text{m}$
- Minor axis: 51  $\mu\text{m}$
- Major axis/Minor axis: 2.9

**Observed internal texture**

- OZ

Fig. 101 Zircon data of grain No. HGD42

**Morphological observation and CL observation for multi-layers**



<Legend>

OZ: Oscillatory zoning

PT: Porous texture

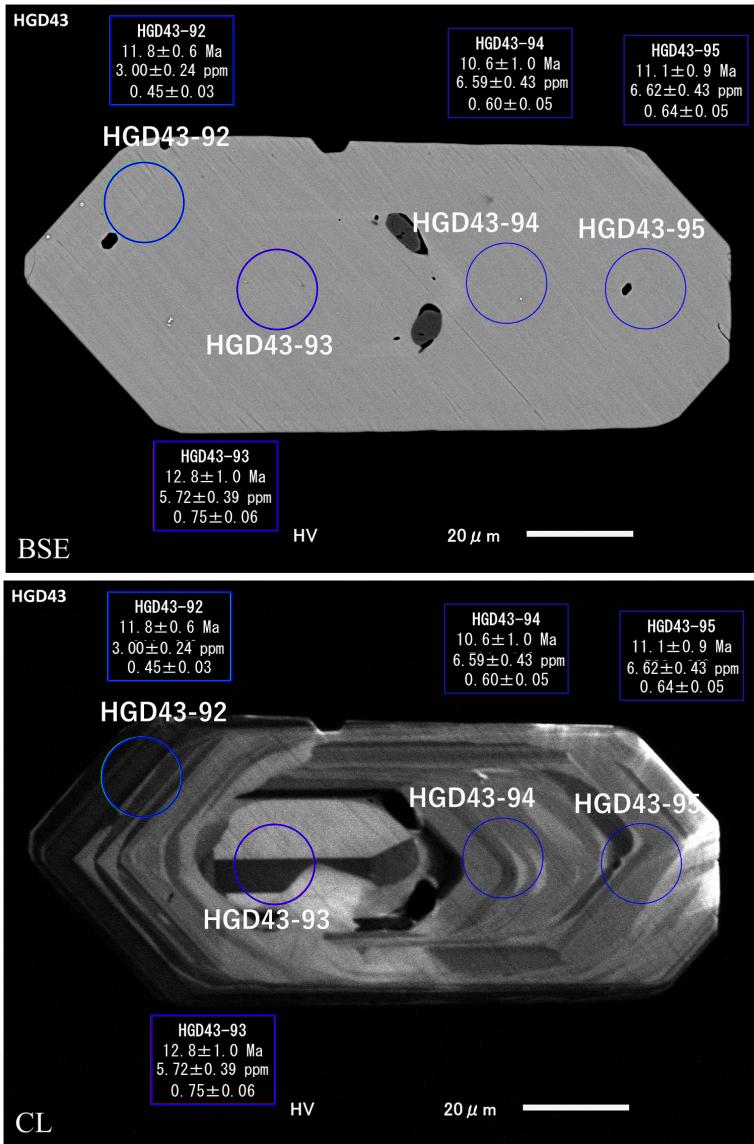
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : ○ PT : ○ IHC : ○ CT : ○



**Morphological description**

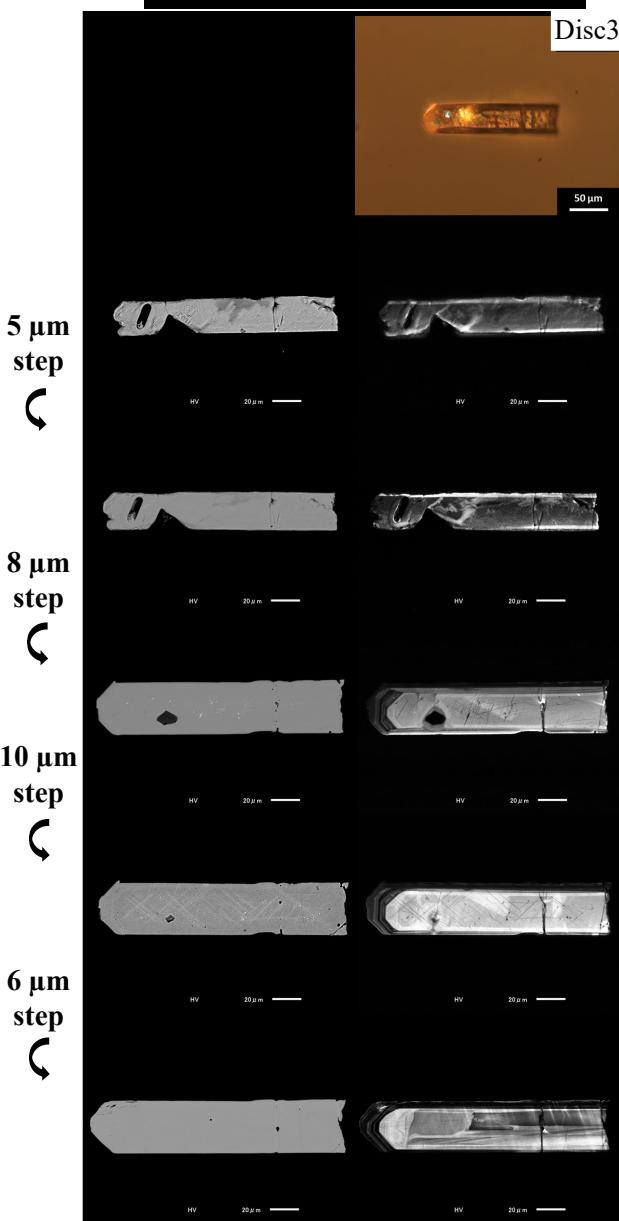
- Type {100}
- Major axis: 142 μm
- Minor axis: 51 μm
- Major axis/Minor axis: 2.8

**Observed internal texture**

- OZ
- PT

Fig. 102 Zircon data of grain No. HGD43

## Morphological observation and CL observation for multi-layers



BSE images

CL images

<Legend>

OZ: Oscillatory zoning

PT: Porous texture

CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

## Analysis spots for U-Pb age and Ti conc., Th/U ratio

OZ : PT : IHC : CT :

Dropped out

## Morphological description

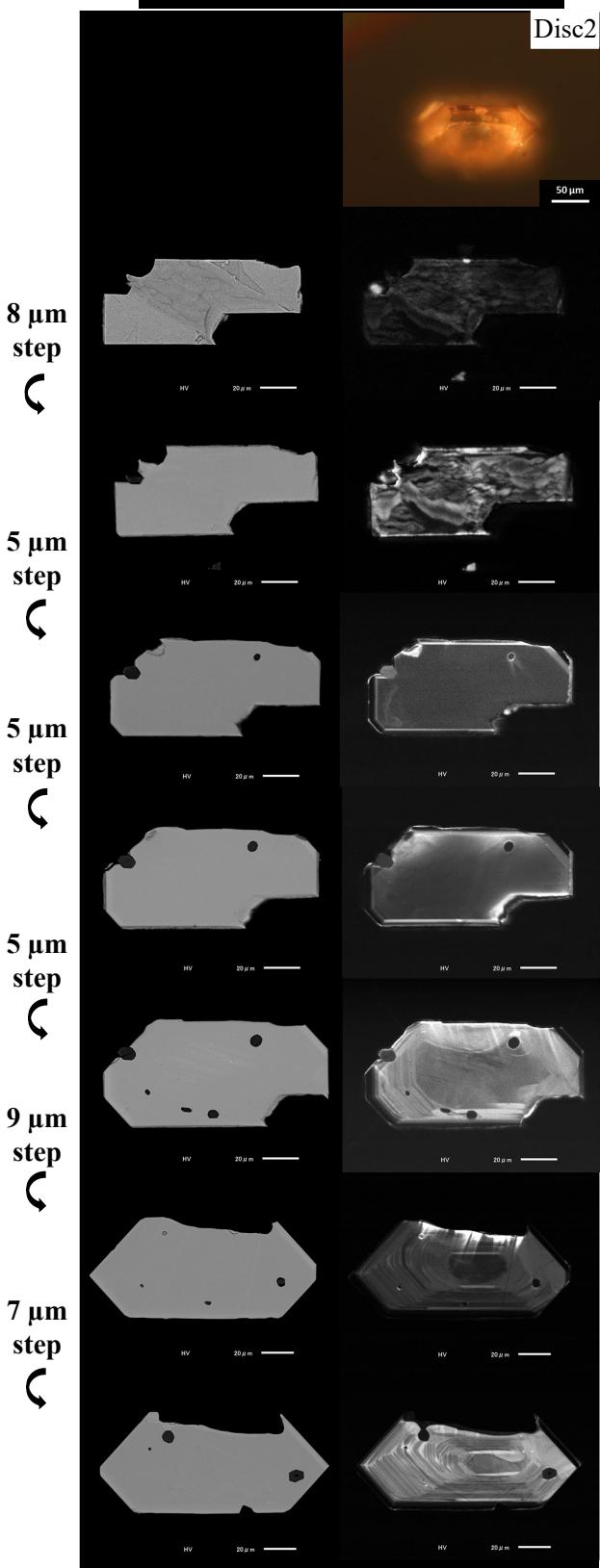
- Type {110}
- Major axis: 177 µm
- Minor axis: 38 µm
- Major axis/Minor axis: 4.7

## Observed internal texture

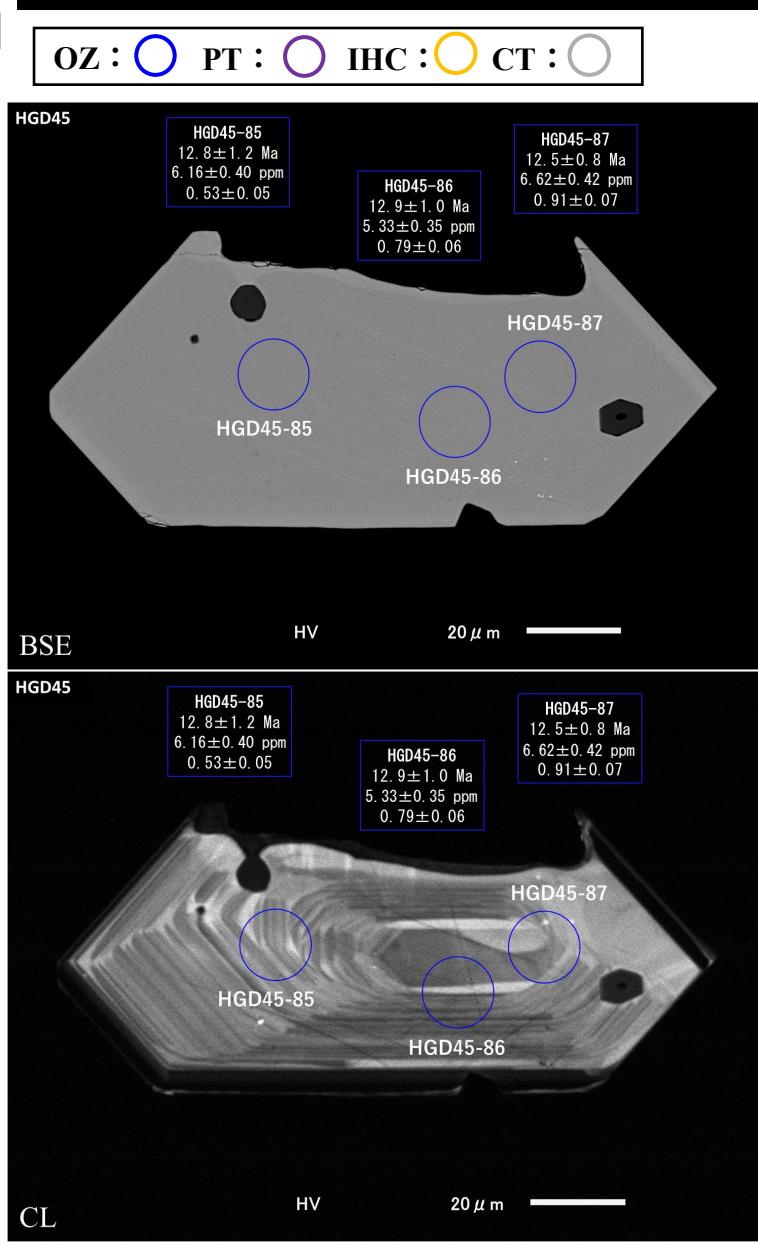
- OZ

Fig. 103 Zircon data of grain No. HGD44

## Morphological observation and CL observation for multi-layers



## Analysis spots for U-Pb age and Ti conc., Th/U ratio



## Morphological description

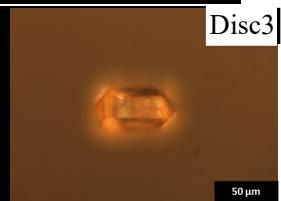
- Type {100}
- Major axis: 144  $\mu\text{m}$
- Minor axis: 62  $\mu\text{m}$
- Major axis/Minor axis: 2.3

## Observed internal texture

- OZ
- PT

Fig. 104 Zircon data of grain No. HGD45

**Morphological observation and CL observation for multi-layers**



5  $\mu\text{m}$   
step



8  $\mu\text{m}$   
step



10  $\mu\text{m}$   
step



6  $\mu\text{m}$   
step



5  $\mu\text{m}$   
step



**BSE images**

**CL images**

<Legend>

OZ: Oscillatory zoning

PT: Porous texture

CT: Chaotic texture

LDT: Local disturbance texture

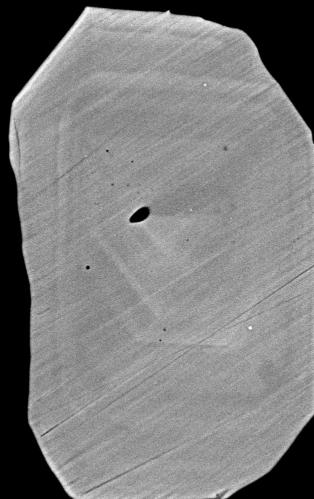
IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :

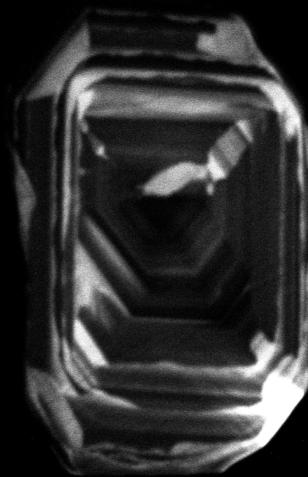
HGD46

BSE



HGD46

CL



**Morphological description**

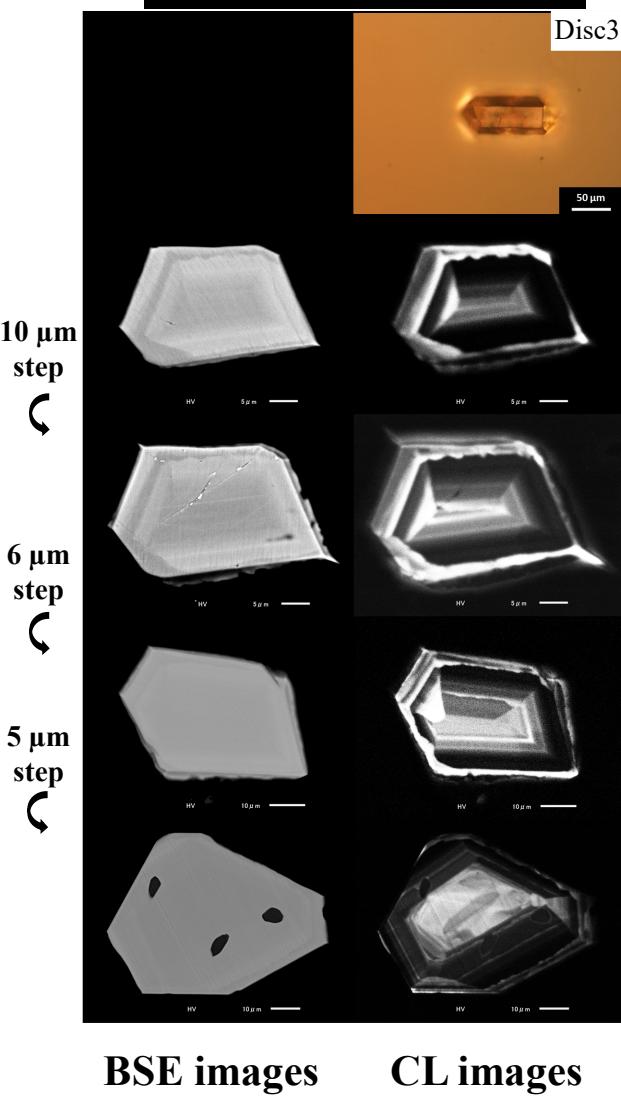
- Type {100}
- Major axis: 100  $\mu\text{m}$
- Minor axis: 51  $\mu\text{m}$
- Major axis/Minor axis: 1.9

**Observed internal texture**

- OZ
- PT

Fig. 105 Zircon data of grain No. HGD46

**Morphological observation and CL observation for multi-layers**



**BSE images**

**CL images**

**<Legend>**

OZ: Oscillatory zoning

PT: Porous texture

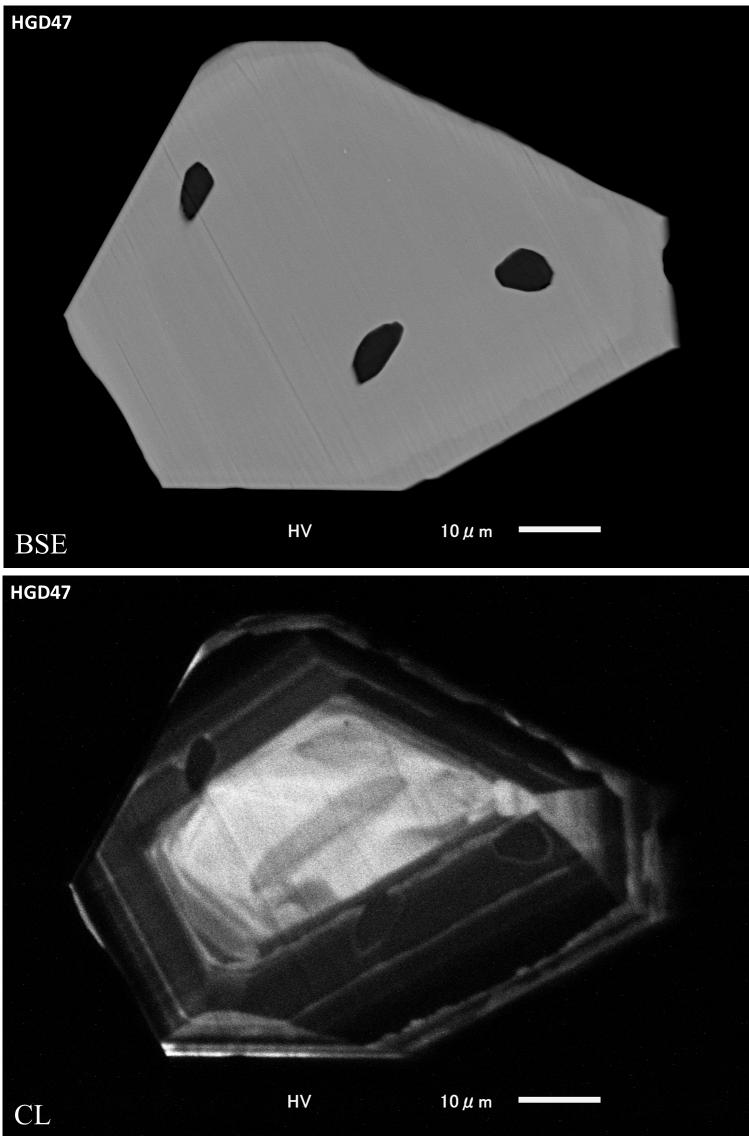
CT: Chaotic texture

LDT: Local disturbance texture

IHC: Inherited core

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

- Type {100}
- Major axis: 121 μm
- Minor axis: 48 μm
- Major axis/Minor axis: 2.5

**Observed internal texture**

- OZ
- PT

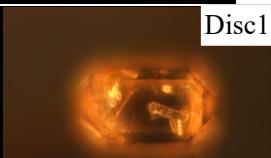
Fig. 106 Zircon data of grain No. HGD47

**Morphological observation and CL observation for multi-layers**

6  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$



50  $\mu\text{m}$

8  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$



HV 50  $\mu\text{m}$

8  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$



HV 50  $\mu\text{m}$

7  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$

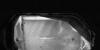


HV 50  $\mu\text{m}$

5  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$



HV 50  $\mu\text{m}$

5  $\mu\text{m}$   
step



HV 50  $\mu\text{m}$



HV 50  $\mu\text{m}$

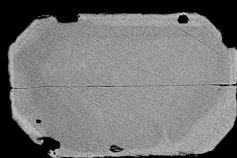
**BSE images**

**CL images**

**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :

HGD48

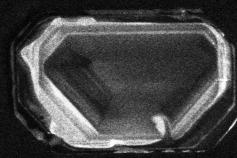


HV

50  $\mu\text{m}$

BSE

HGD48



HV

50  $\mu\text{m}$

CL

**Morphological description**

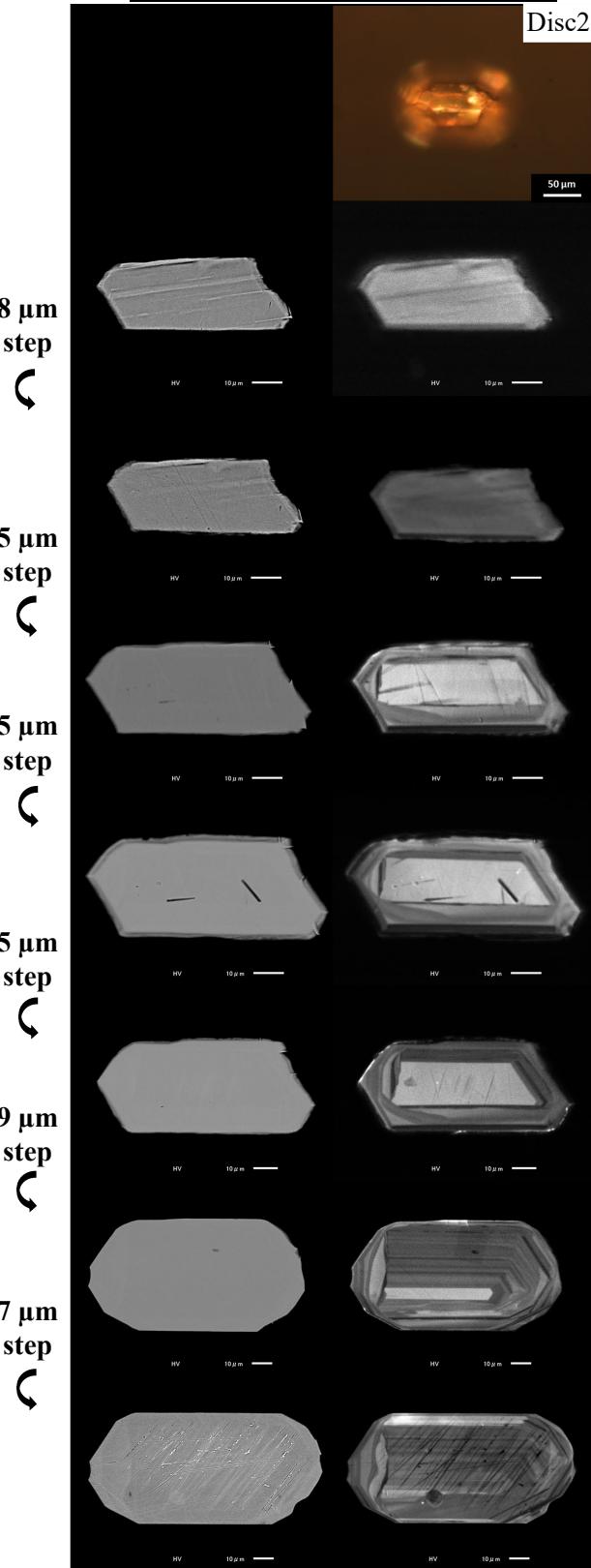
- Type {100}
- Major axis: 180  $\mu\text{m}$
- Minor axis: 95  $\mu\text{m}$
- Major axis/Minor axis: 1.9

**Observed internal texture**

- OZ

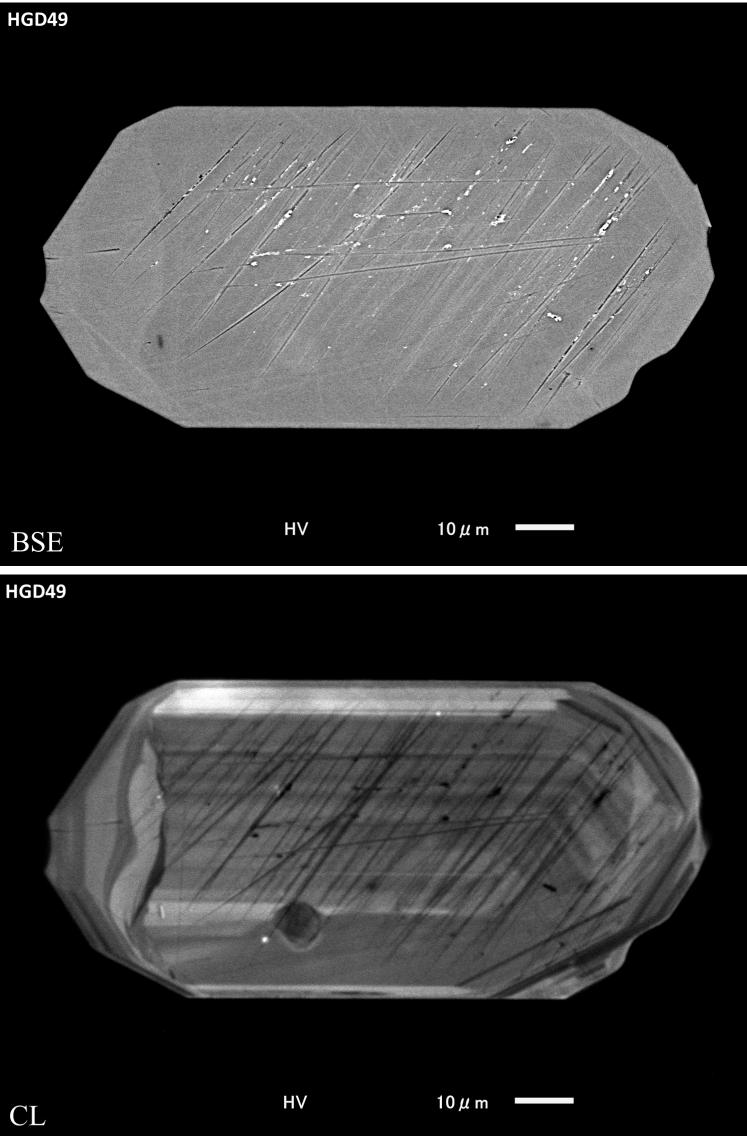
Fig. 107 Zircon data of grain No. HGD48

**Morphological observation and CL observation for multi-layers**



**Analysis spots for U-Pb age and Ti conc., Th/U ratio**

OZ : PT : IHC : CT :



**Morphological description**

- Type {100}
- Major axis: 113  $\mu\text{m}$
- Minor axis: 60  $\mu\text{m}$
- Major axis/Minor axis: 1.9

**Observed internal texture**

- OZ

Fig. 108 Zircon data of grain No. HGD49