Scenario 1: Crystallization (230 Ma) / Alteration (100 Ma)

Diffusion parameters Mixed phases

D0 (cm²/s) Ea (J/mol)

Radius

(µm)

Modal composition

%K2O for each mineral

K2O contribution Ca/K (mixed phase)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Anorthite | 5.00E-02 | 196000 | 125 | 99.90% | 0.10% | 91% | 50 |
| Muscovite | 1.00E-01 | 243000 | 3 | 0.06% | 10.00% | 5% | 0 |
| Muscovite | 1.00E-01 | 243000 | 20 | 0.05% | 10.00% | 4% | 0 |

Thermal history

Crystallization age 1= 230 Ma Alteration age 2= 100.00 Ma

Cooling

Start (Ma) End (Ma) Duration (Ma) Starting temp. (°C)

Ending temp. (°C)

rate

(°C/Ma)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Period 1 | 102 | 101 | 0 | 0 | 150 | -7500 |
| Period 2 | 101 | 101 | 0 | 150 | 150 | 0 |
| Period 3 | 101 | 101 | 0 | 150 | 0 | 15000 |
| Period 4 | 101 | 0 | 101 | 0 | 0 | 0 |

Scenario 2: Crystallization (201.5 Ma) / Excess 40Ar\*

Diffusion parameters Mixed phases

D0 (cm²/s) Ea (J/mol)

Radius

(µm)

Modal composition

%K2O for each mineral

K2O contribution Ca/K (mixed phase)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Anorthite | 5.00E-02 | 196000 | 125 | 99.00% | 0.10% | 99.1% | 63 |
| Muscovite | 1.00E-01 | 243000 | 3 | 0.00% | 10.00% | 0.0% | 0 |
| CPX | 1.36E+00 | 379200 | 0.7 | 0.01% | 10.00% | 0.9% | 0 |

Thermal history

Crystallization age 1= 2000 Ma Alteration age 2= 2000.00 Ma

Cooling

Start (Ma) End (Ma) Duration (Ma) Starting temp. (°C)

Ending temp. (°C)

rate

(°C/Ma)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Period 1 | 202 | 201 | 0 | 0 | 500 | -25000 |
| Period 2 | 201 | 201 | 0 | 500 | 500 | 0 |
| Period 3 | 201 | 201 | 0 | 500 | 0 | 50000 |
| Period 4 | 201 | 0 | 201 | 0 | 0 | 0 |

Scenario 3a: Crystallization (201.5 Ma) / Alteration (200 Ma) / Excess 40Ar

Diffusion parameters Mixed phases

D0 (cm²/s) Ea (J/mol)

Radius

(µm)

Modal composition

%K2O for each mineral

K2O contribution Ca/K (mixed phase)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Anorthite | 5.00E-02 | 196000 | 125 | 90.10% | 0.10% | 90.1% | 50 |
| Muscovite | 1.00E-01 | 243000 | 8 | 9.00% | 10.00% | 9.0% | 0 |
| CPX | 1.36E+00 | 379200 | 0.7 | 0.01% | 10.00% | 0.9% | 0 |

Thermal history

Crystallization age 1= 2000 Ma Alteration age 2= 2000.00 Ma

Cooling

Start (Ma) End (Ma) Duration (Ma) Starting temp. (°C)

Ending temp. (°C)

rate

(°C/Ma)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Period 1 | 202 | 201 | 0 | 0 | 500 | -25000 |
| Period 2 | 201 | 201 | 0 | 500 | 500 | 0 |
| Period 3 | 201 | 201 | 0 | 500 | 0 | 50000 |
| Period 4 | 201 | 0 | 201 | 0 | 0 | 0 |

Scenario 3b: Crystallization (201.5 Ma) / Alteration (100 Ma) / Excess 40Ar\*

Diffusion parameters Mixed phases

D0 (cm²/s) Ea (J/mol)

Radius

(µm)

Modal composition

%K2O for each mineral

K2O contribution Ca/K (mixed phase)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Anorthite | 5.00E-02 | 196000 | 125 | 99.50% | 0.10% | 98.50% | 40 |
| Muscovite | 1.00E-01 | 243000 | 6 | 0.50% | 10.00% | 0.50% | 0 |
| CPX | 1.36E+00 | 379200 | 1 | 0.01% | 10.00% | 1.00% | 0 |

Thermal history

Crystallization age 1= 201.5 Ma Alteration age 2= 2000.00 Ma

Cooling

Start (Ma) End (Ma) Duration (Ma) Starting temp. (°C)

Ending temp. (°C)

rate

(°C/Ma)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Period 1 | 102 | 101 | 0 | 0 | 150 | -7500 |
| Period 2 | 101 | 101 | 0 | 150 | 150 | 0 |
| Period 3 | 101 | 101 | 0 | 150 | 0 | 15000 |
| Period 4 | 101 | 0 | 101 | 0 | 0 | 0 |