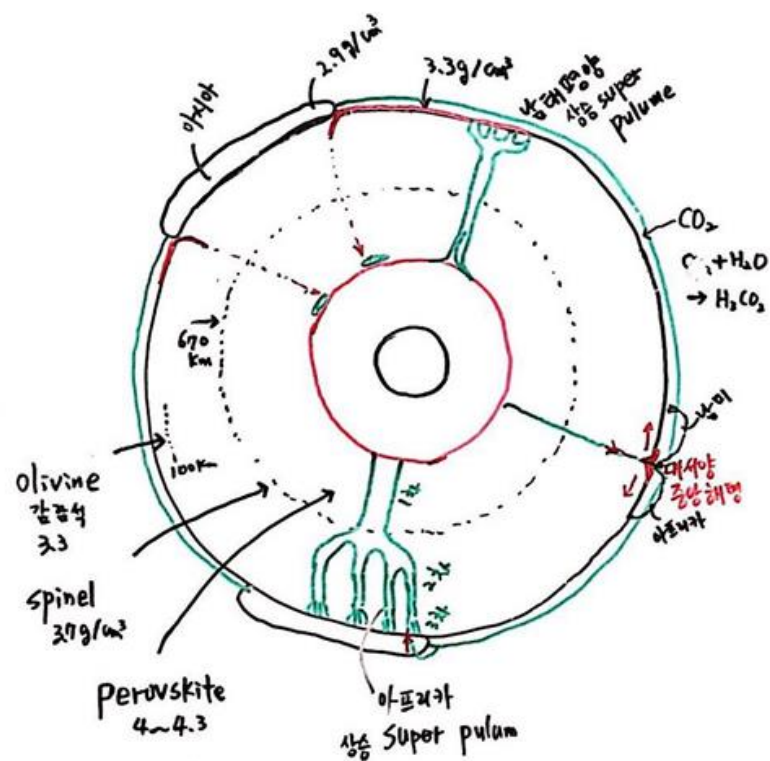


원핵세포 → 광합성 → 진핵세포 → 파생 → 캄브리아 대폭발 → 녹색식물 대 → 척추동물 출현

(c

원자 → 이온 → 광물 → 암석

→ 지각 → 해양 지각 → 대기 해양 → 지구 표층사  
대륙 지각 대륙



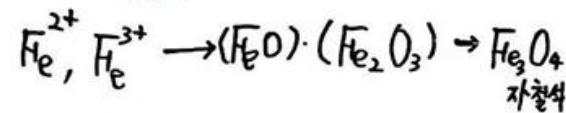
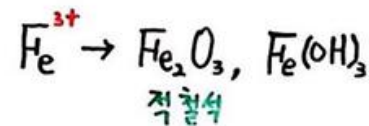
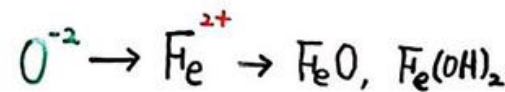
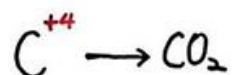
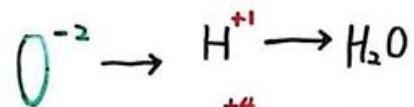
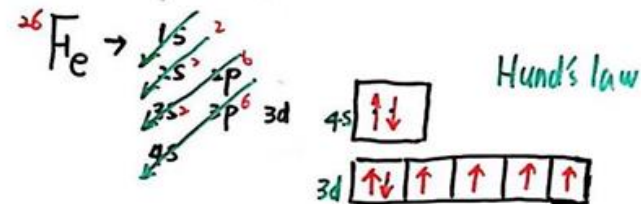
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|----|----|--|----|----|----|----|----|----|
| H  |    |  |    |    |    | Fe |    | He |
| Li | Be |  | B  | C  | N  | O  | F  | Ne |
| Na | Mg |  | Al | Si | P  | S  | Cl | Ar |
| K  | Ca |  | Ga | Ge | As | Se | Br | Kr |

규산

탄산

인산

황산



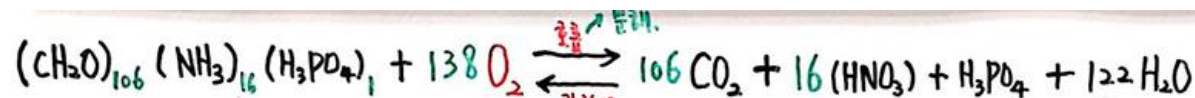
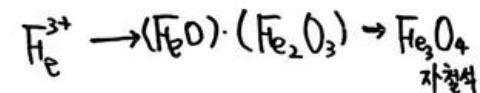
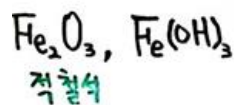
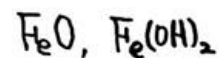
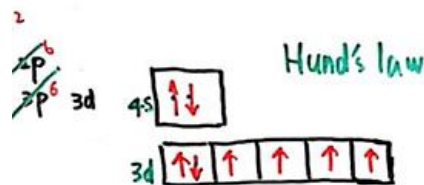
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2

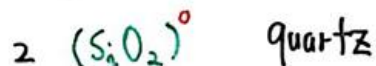
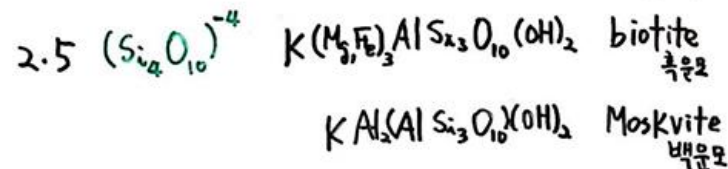
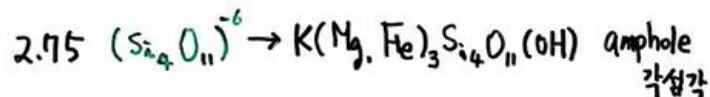
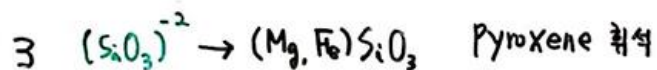
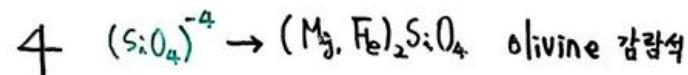
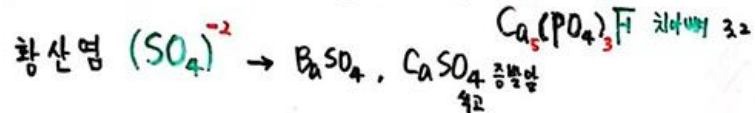
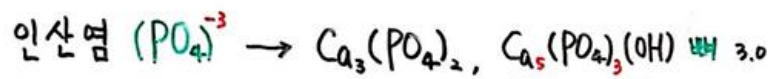
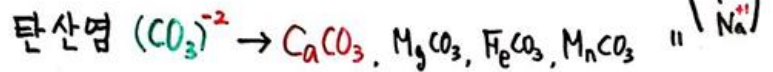
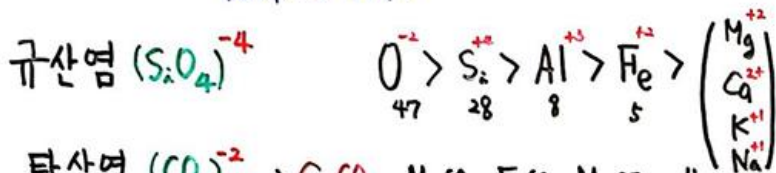
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→ 철후원층

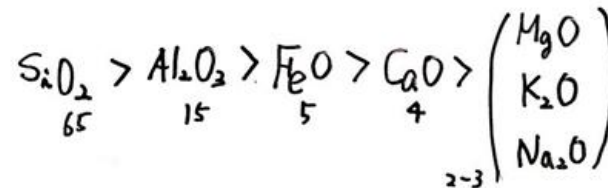
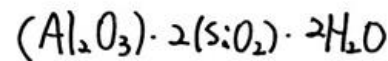
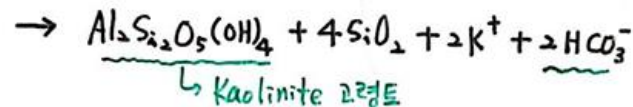
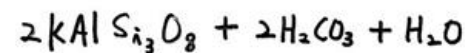
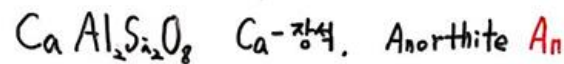
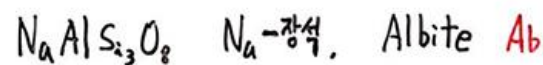
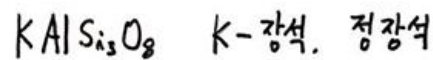
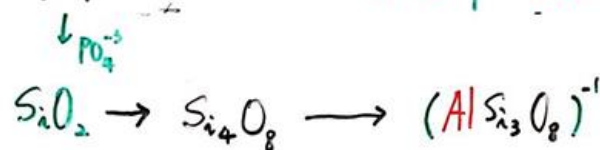
|    |    |
|----|----|
|    | He |
| F  | Ne |
| Cl | Ar |
| Br | Kr |



Redfield Ratio



C:N:P = 106:16:1



Cambrian → Ordovician

Triassic → Jurassic

세지윅, 머튼 18

북웨일즈 남웨일즈

↓

Cambrian Silurian

Devonian Permian

large igneol

Siberian trap 250 Ma

CAMP 200M Karoo 1

Pitana 130 Ontong

Kerguelen 115

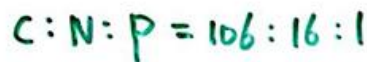
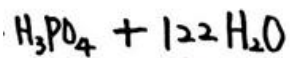
Caribbean 90 Deccan

North Atlantic 60 C

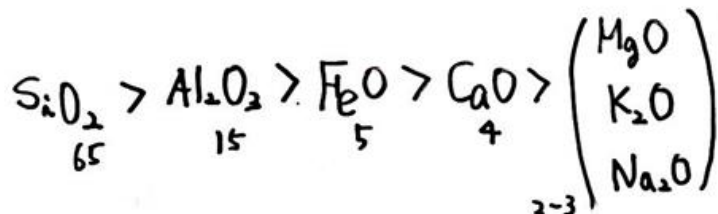
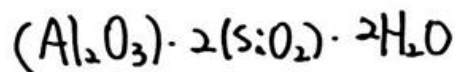
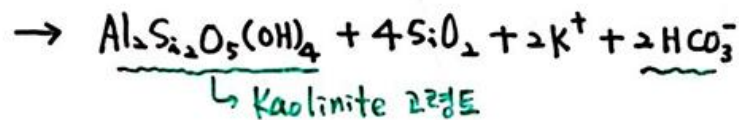
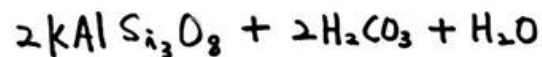
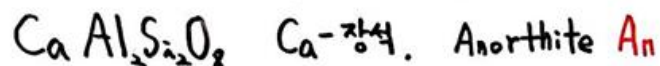
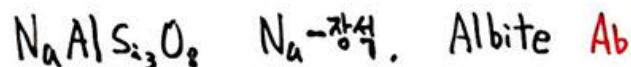
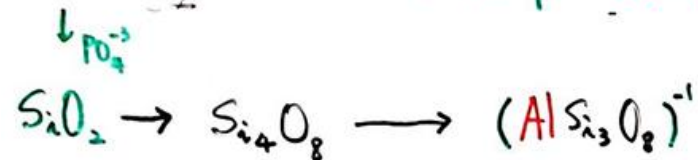
H<sub>2</sub>O

해양 > 빙하 > 지리  
97.8 1.97 0





Cambrian → Ordovician → Silurian → Devonian → Carboniferous → Permian



Triassic → Jurassic → Cretaceous → Tertiary

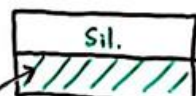
세지웁, 머치슨 1831

북웨일즈

↓  
Cambrian  
Devonian

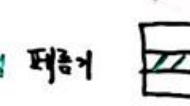
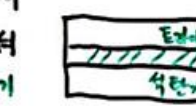
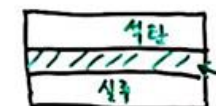
남웨일즈

↓  
Silurian  
Permian



쥐라산 → 프/스 석회암

Ordovician



독일 지역  
트라이아스  
삼엽기

large igneous province

Siberian trap 250 Ma

CAMP 200M Karoo 183

Pirana 130 Ontong Java 125

Kerguelen 115

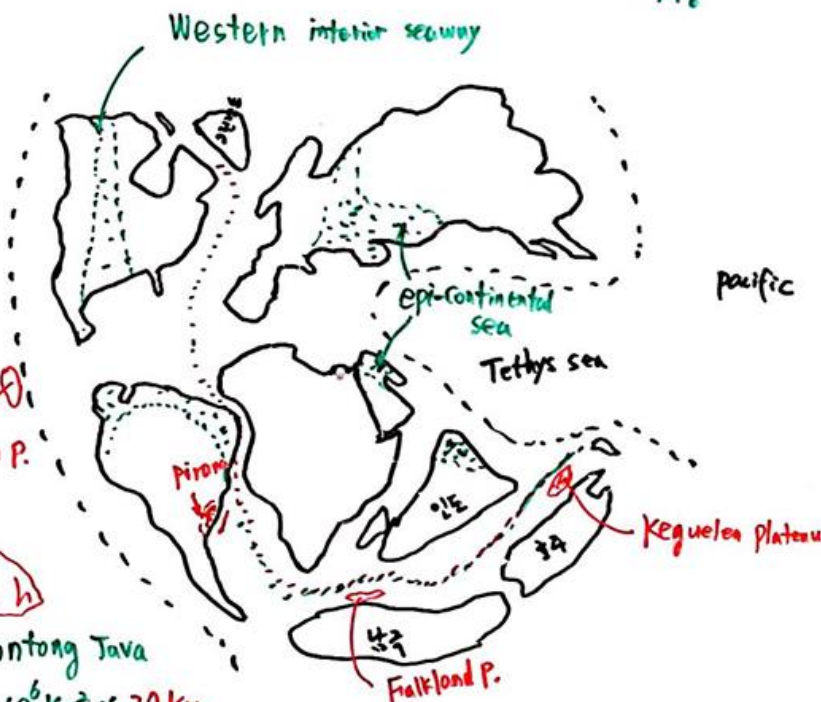
Caribbean 90 Deccan trap 66

North Atlantic 60 CRB

OAE2  
Caribbean P.



Ontong Java  
2x10<sup>6</sup> km<sup>2</sup> x 30 km



H<sub>2</sub>O

해양 > 빙하 > 지하수 > ...  
97.8      1.97      0.1 ...

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te  
이루  
vite  
백운모