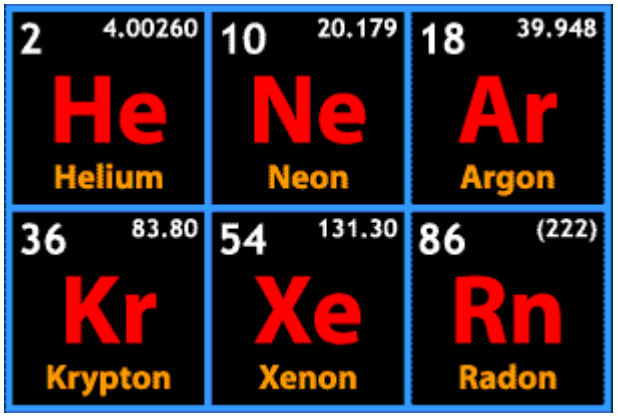
Noble gas geochemistry

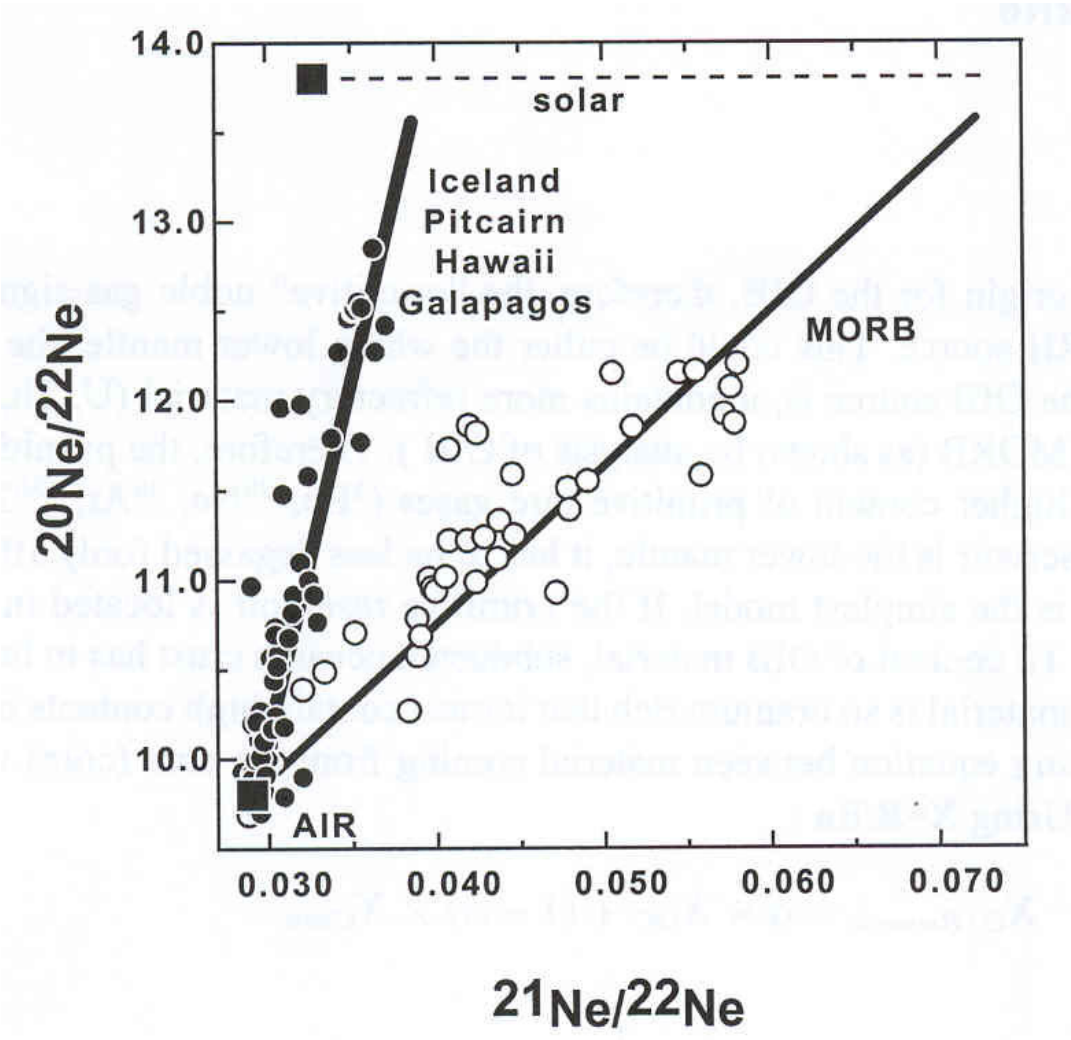


- Primordial noble gases: ^{3}He, ^{20}Ne, ^{36}Ar, ^{130}Xe
- Produced by radioelement decay: ^{4}He, ^{21}Ne, ^{40}Ar, ^{129}Xe

Neon isotopes

- Nobel gas geochemistry

2 4.00260 **He** Helium	10 20.179 **Ne** Neon	18 39.948 **Ar** Argon
36 83.80 **Kr** Krypton	54 131.30 **Xe** Xenon	86 (222) **Rn** Radon



Noble gas geochemistry

^{4}He: radiogenic, from ^{235}U-, ^{238}U- and ^{232}Th-decay
^{3}He cosmogenic or primordial

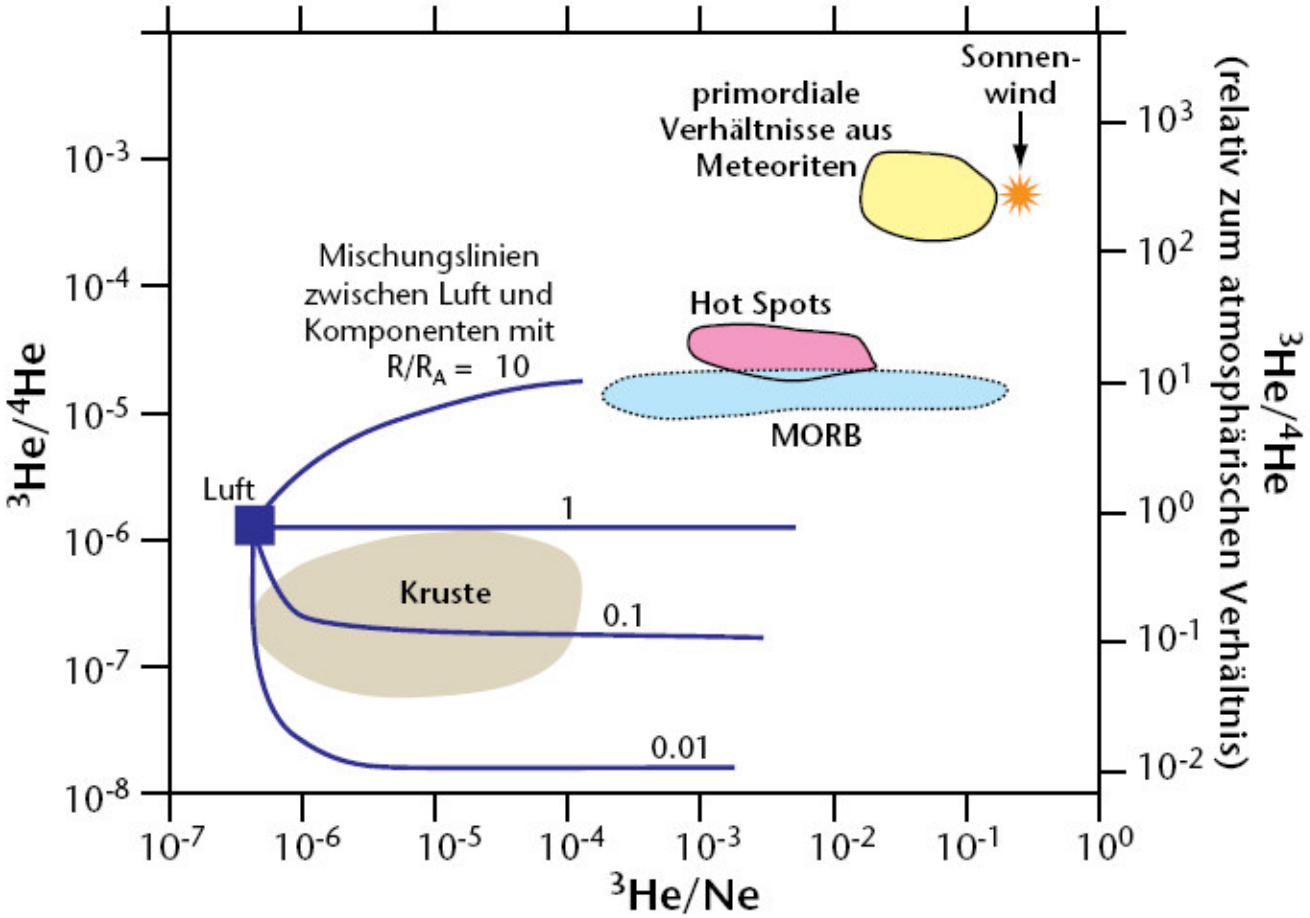
Upper Mantle depleted in U and Th
Lower Mantle not depleted in U and Th

Upper Mantle $^{3}He/^{4}He$: 12.6×10^{-6}
Lower Mantle $^{3}He/^{4}He$: $\sim 45 \times 10^{-6}$

$^{3}He/^{4}He$ in atmosphere: $\sim 1.4 \times 10^{-6}$

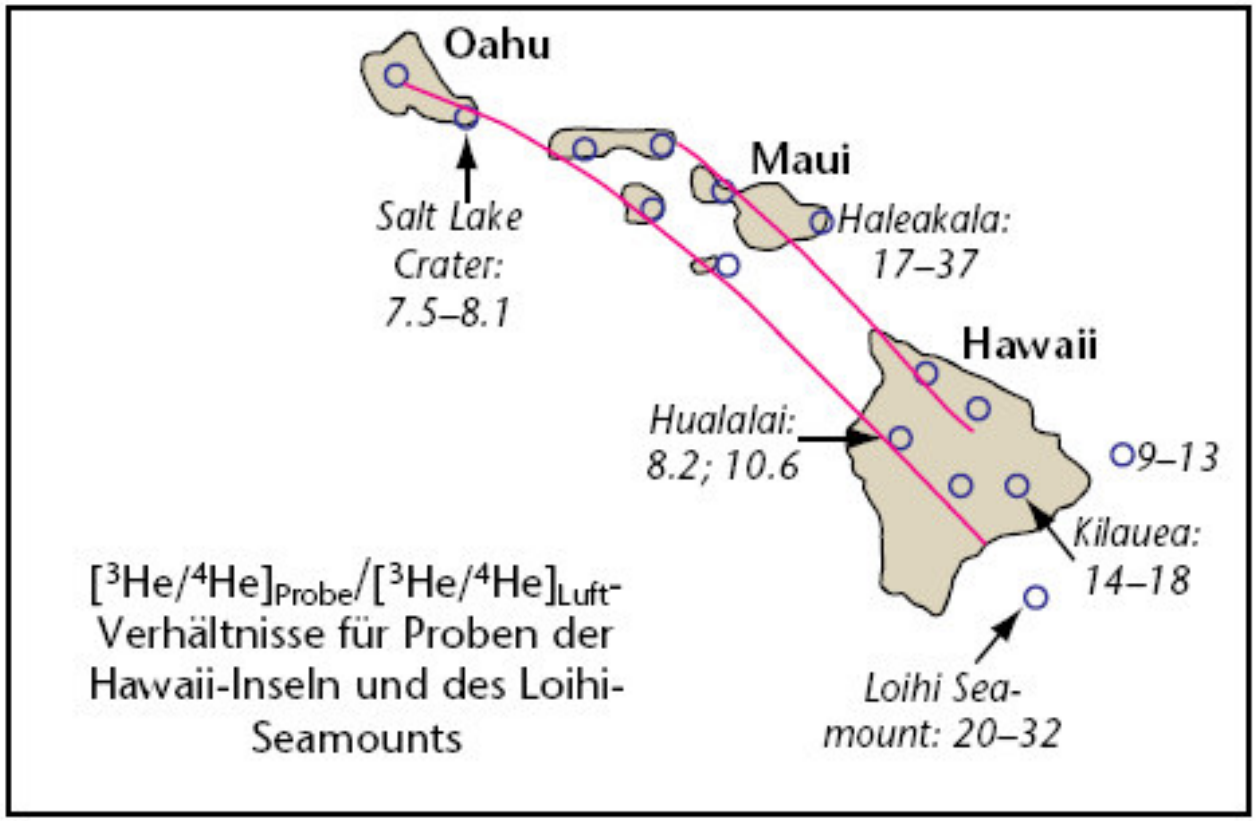
Implications: different degrees of degassing
Primordial or undegassed deep mantle reservoir
Two layer model of the Earth mantle (?)

Edelgase



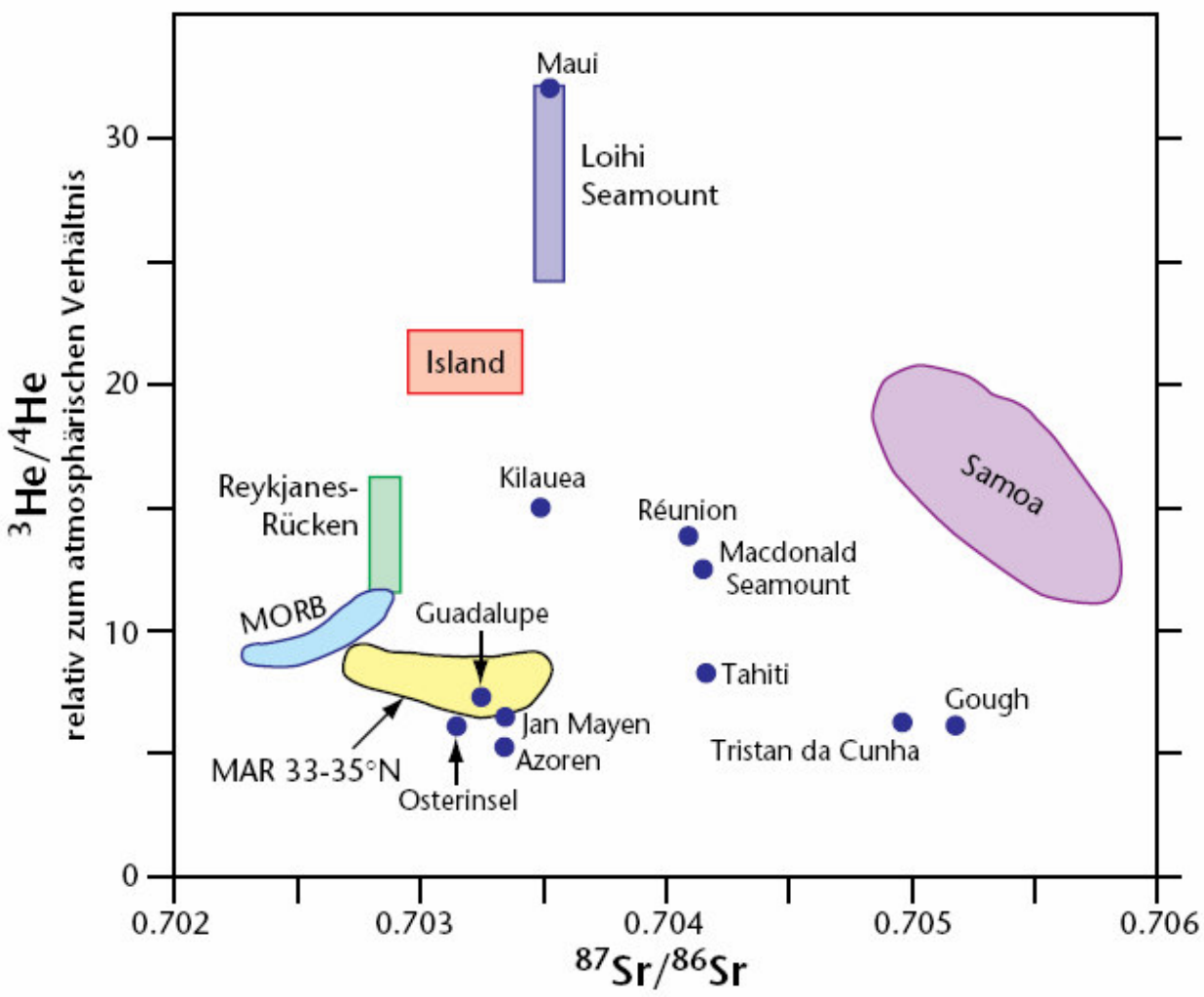
http://www.dmg-home.de/Ressourcen/Internet-Kurse/Isotopengeochemie.pdf

He-Isotopendaten Hawaii



http://www.dmg-home.de/Ressourcen/Internet-Kurse/Isotopengeochemie.pdf

Variation von He und Sr in OIBs und MORBs



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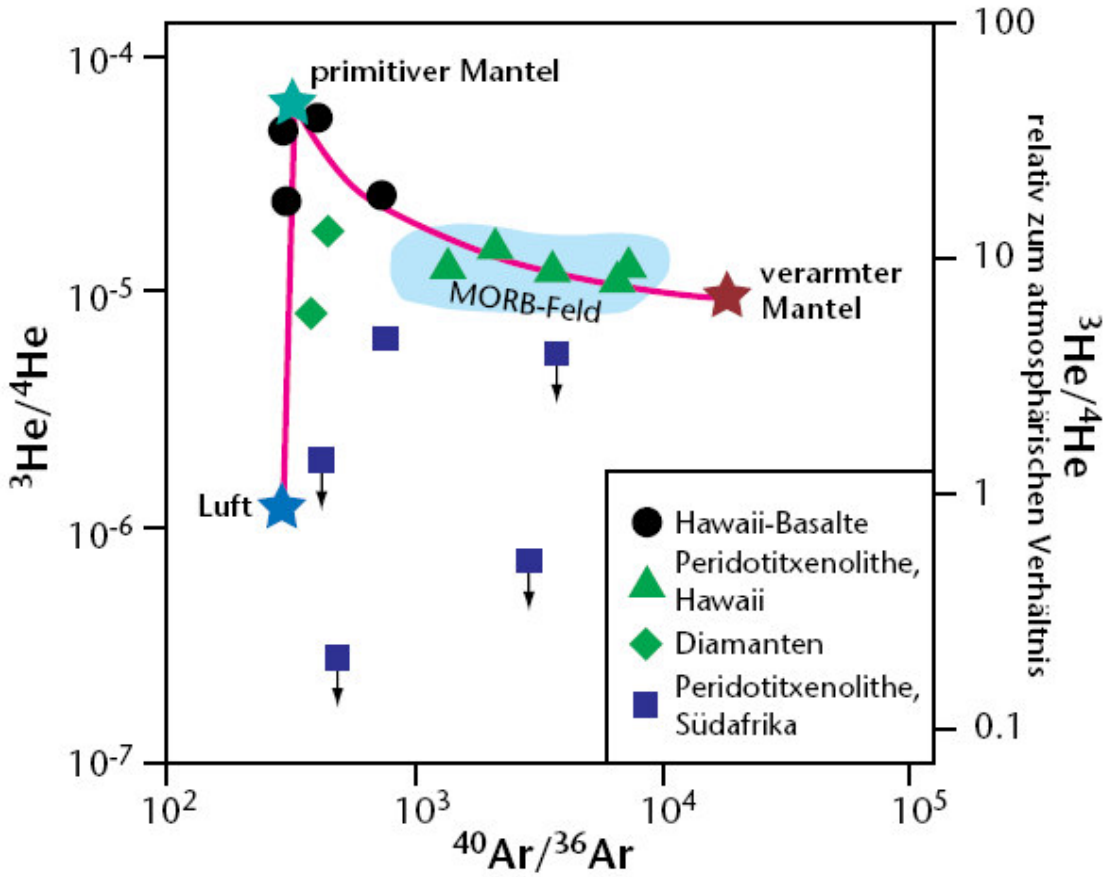
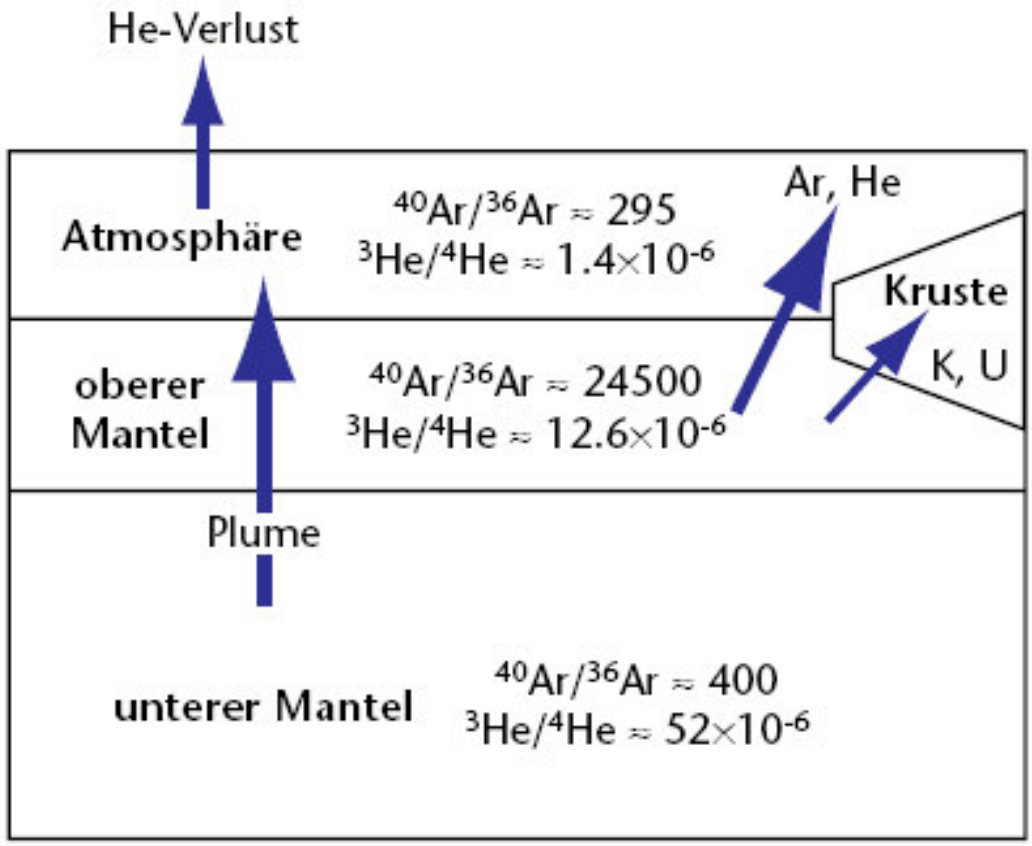
He und Ar im Erdmantel



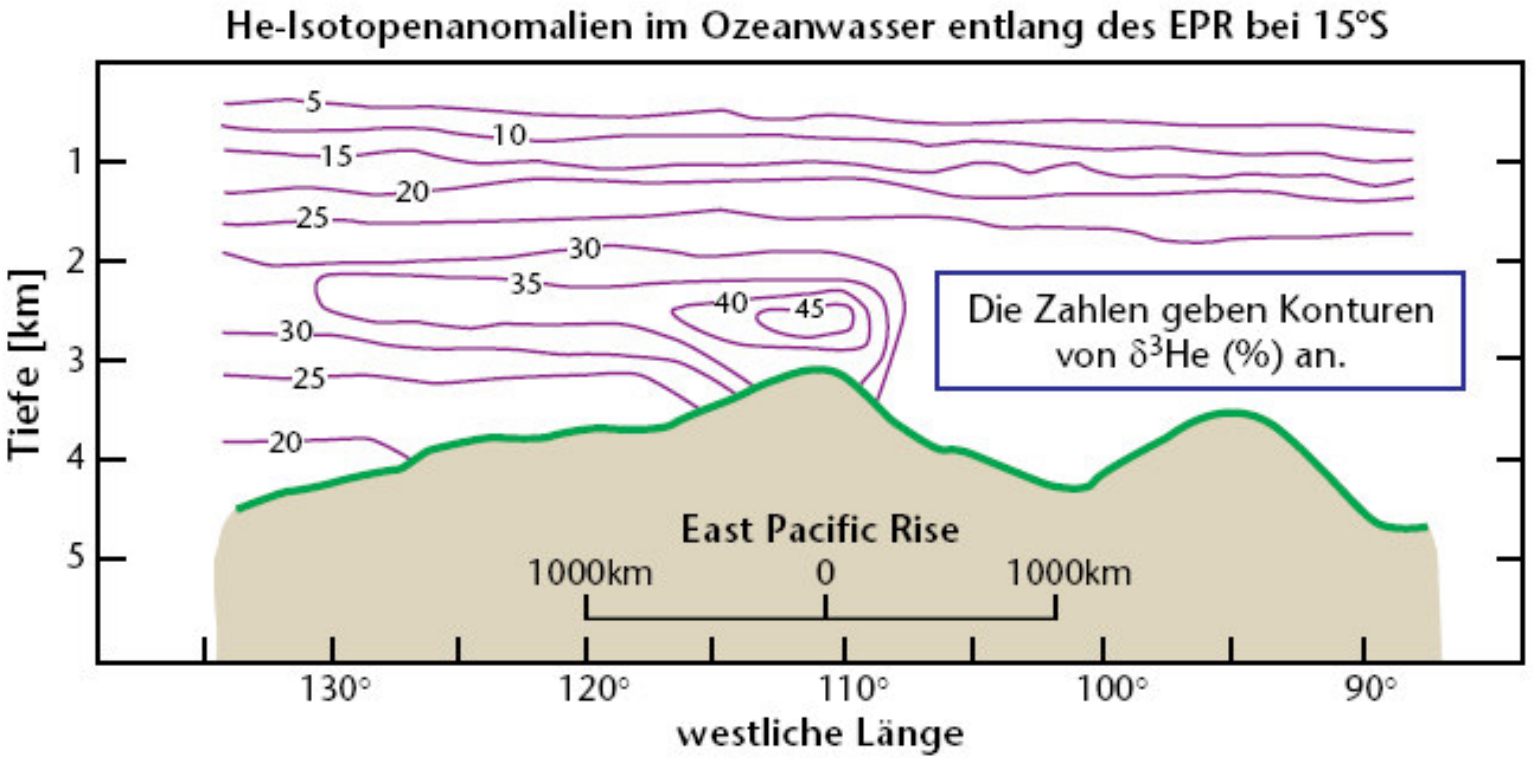
Stosch: Isotopengeochemie

He und Ar im Erdmantel



Hart 1985 (aus Stosch: Isotopengeochemie)

He-Entgasung



Stosch: Isotopengeochemie