

K-Ar DATING

RADIOACTIVE FORM OF POTASSIUM

* HALF-LIFE OF ^{40}K = 1.25 BILLION YEARS (K-40)

→ AFTER THIS TIME, ONLY HALF ^{40}K REMAINS, REST DECAYS TO ^{40}Ar & ^{40}Ca (BOTH RADIOACTIVE)

FOSSILS ACCUMULATE IN SEDIMENTARY ROCK BETWEEN VOLCANIC ROCK LAYERS

DATING THESE FOSSILS IS AN APPROXIMATION BY DATING LAYERS ABOVE & BELOW THE FOSSILS

HOW K-AR DATING WORKS

→ OVER TIME, ^{40}K → ^{40}Ar & ^{40}Ca } REACTIVE METAL
NOBLE GAS

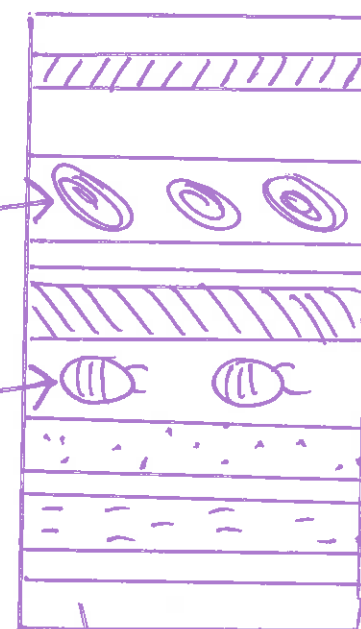
^{40}Ar LEVELS ↑ WITH ^{40}K DECAYS

∴ ^{40}Ar CAN BE MEASURED

RATIO OF ^{40}K : ^{40}Ar CAN DETERMINE THE AGE OF LAVA ROCK > 100,000

YOUNGER

OLDER



VOLCANIC ROCK IS FORMED FROM MOLTEN LAVA (1000°C) ∴ NO ORGANIC MATERIAL WILL BE FOUND HERE LG FOSSILS

ONLY VOLCANIC ROCKS & VOLCANIC ASH AGE CAN BE DETERMINED

→ RADIOACTIVE ^{40}K & ^{40}Ar IS MEASURED IN THESE ROCKS

NEW VOLCANIC ERUPTIONS DEPOSIT NEW LAYERS OF ASH/ROCK

ADVANTAGES	DISADVANTAGES
✓ OLD SAMPLES DATED	x ONLY USEFUL IN VOLCANIC ROCK
✓ PRECISE DATES FOR VOLCANIC ROCKS	x CAN ONLY DATE ROCKS > 100,000 Y.
✓ CONSTANT RATE OF DECAY	x < 100,000 ONLY 0.0053% ^{40}K DECAYS
	x AGE OF SEDIMENTARY ROCK ONLY DETERMINED BETWEEN VOLCANIC ROCKS