

ISOTOPE NOMENCLATURE AND ANALYTICAL LABORATORIES

Hydrogen stable isotopes (d D)

δ D analyses reported in ‰ (permil) notation

$$\delta D (\text{‰}) = \left(\frac{{}^2\text{H}/{}^1\text{H}_{\text{sample}}}{{}^2\text{H}/{}^1\text{H}_{\text{standard}}} - 1 \right) \times 1000$$

${}^2\text{H}/{}^1\text{H}_{\text{standard}}$ is VSMOW

(Vienna Standard Mean Ocean Water)

Analysis by Dr. Andy Campbell, NM Tech, Socorro, NM

Oxygen stable isotopes (d ^{18}O)

$\delta^{18}\text{O}$ analyses reported in ‰ (permil) notation

$$\delta^{18}\text{O} (\text{‰}) = \left(\frac{{}^{18}\text{O}/{}^{16}\text{O}_{\text{sample}}}{{}^{18}\text{O}/{}^{16}\text{O}_{\text{standard}}} - 1 \right) \times 1000$$

${}^{18}\text{O}/{}^{16}\text{O}_{\text{standard}}$ is V-SMOW

(Vienna Standard Mean Ocean Water)

Analysis by Dr. Andy Campbell, NM Tech, Socorro, NM

Carbon stable isotopes (d ^{13}C)

$\delta^{13}\text{C}$ analyses reported in ‰ (permil) notation

$$\delta^{13}\text{C} (\text{‰}) = \left(\frac{{}^{13}\text{C}/{}^{12}\text{C}_{\text{sample}}}{{}^{13}\text{C}/{}^{12}\text{C}_{\text{standard}}} - 1 \right) \times 1000$$

${}^{13}\text{C}/{}^{12}\text{C}_{\text{standard}}$ is PDB = 0.011237

(Pee Dee Belemnite)

Analysis by Geochron Laboratories, Cambridge, MA

Sulfur stable isotopes (d ^{34}S)

$\delta^{34}\text{S}$ analyses reported in ‰ (permil) notation

$$\delta^{34}\text{S} (\text{‰}) = \left(\frac{{}^{34}\text{S}/{}^{32}\text{S}_{\text{sample}}}{{}^{34}\text{S}/{}^{32}\text{S}_{\text{standard}}} - 1 \right) \times 1000$$

${}^{34}\text{S}/{}^{32}\text{S}_{\text{standard}}$ is CDT = 0.0450045

(Canyon Diablo Troilite)

Analysis by Geochron Laboratories, Cambridge, MA

Strontium isotopes ($^{87}\text{Sr}/^{86}\text{Sr}$)

$^{87}\text{Sr}/^{86}\text{Sr}$ analyses reported as ratio $^{87}\text{Sr}/^{86}\text{Sr}$

NIST SRM 987 Sr standard = 0.710265

Analysis by Dr. Jay Banner, UT Austin, TX

Uranium isotopes ^{234}U , ^{235}U , ^{238}U

^{234}U , ^{235}U , ^{238}U reported as pCi/L (picoCuries per Liter)

NIST SRM 4321C $^{234}\text{U}/^{238}\text{U}$ standard = 1.038

Analysis by Severn Trent Lab (STL) Richland, WA