THE CADMIUM ISOTOPE COMPOSITION OF EARTH MANTLE AND ITS ORIGIN

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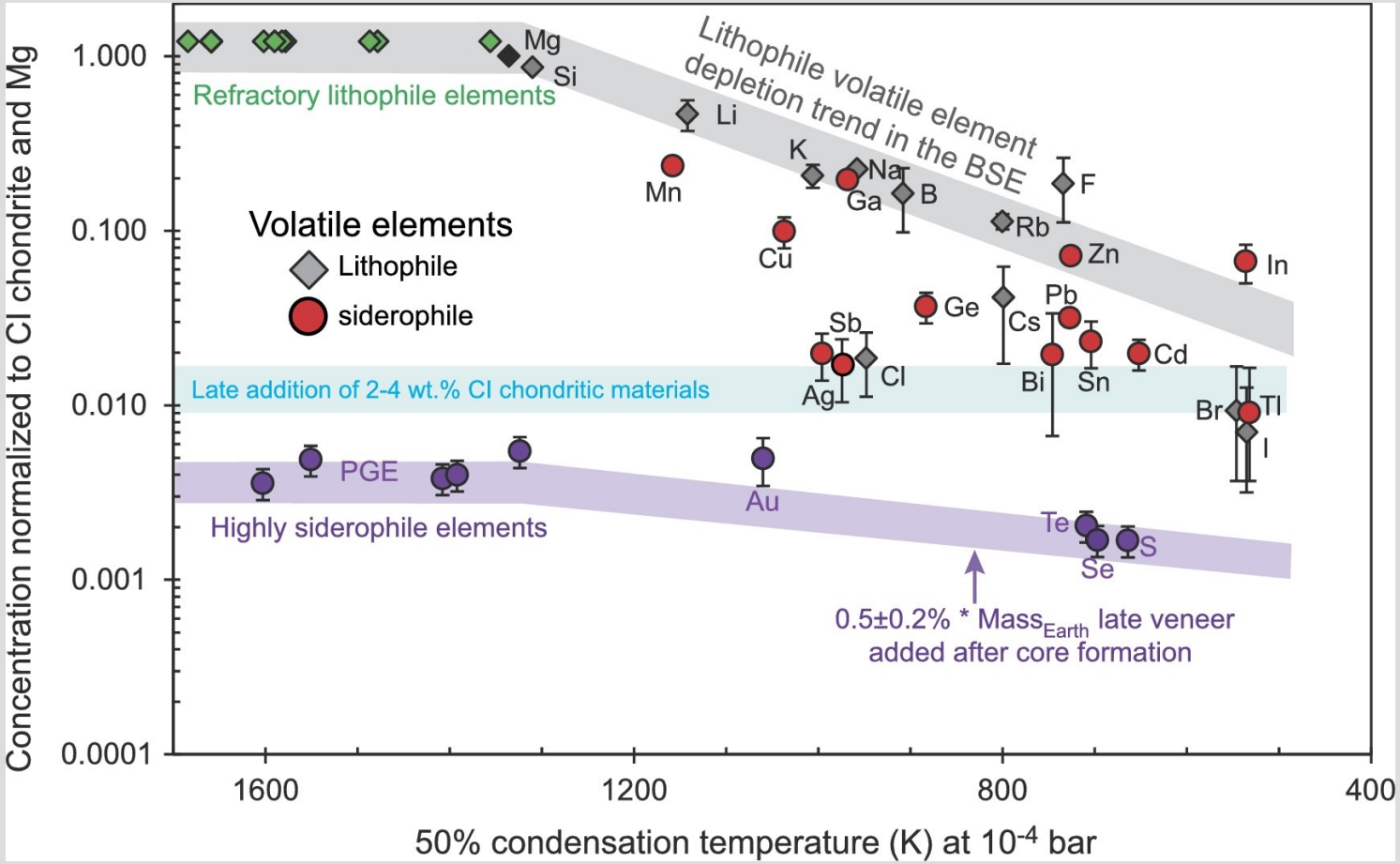
WHY CADMIUM?



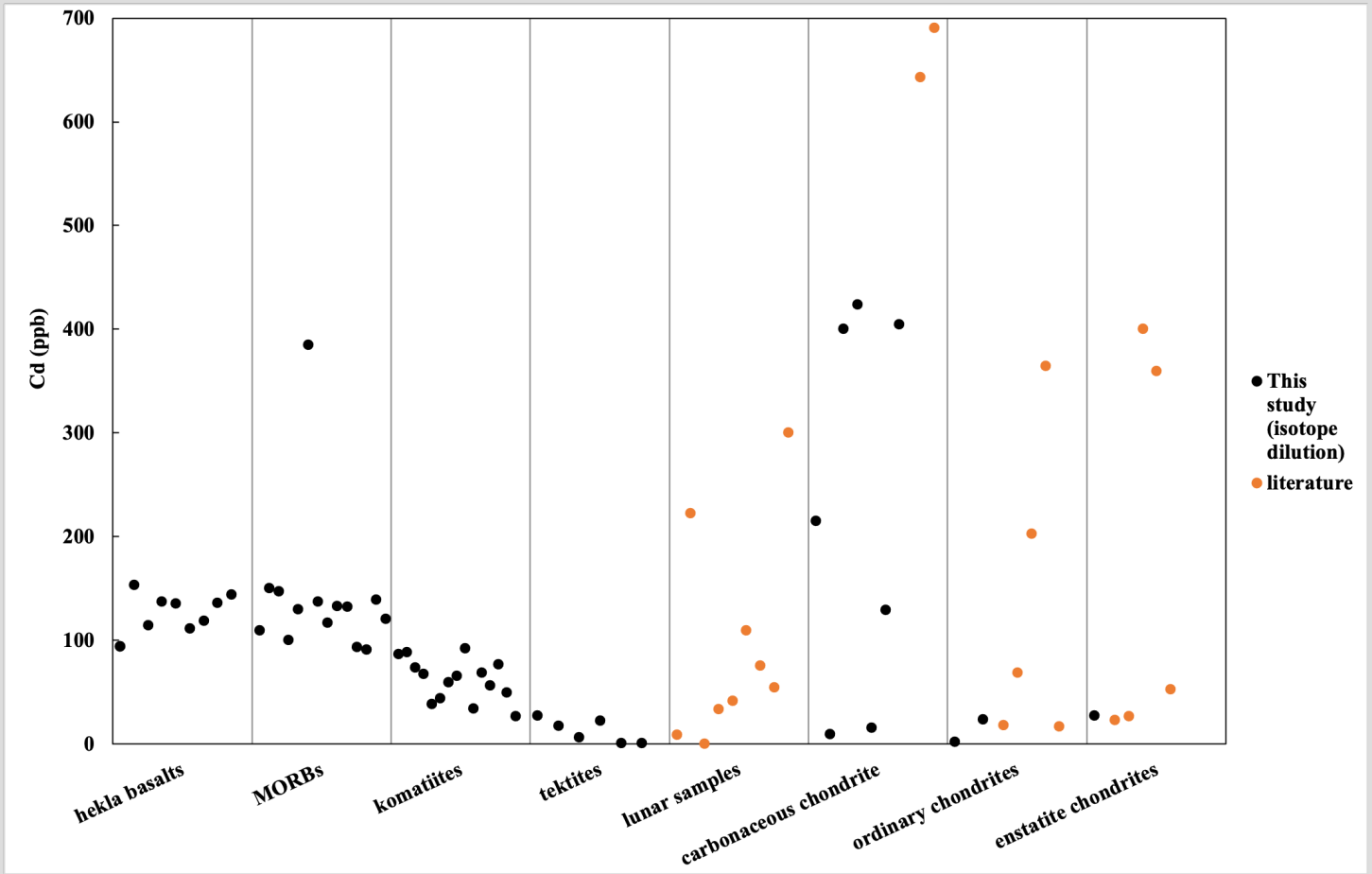
Moderately volatile elements depletion trend in the BSE

Wang et al. (2016)

- T_{50} = 502K (wood et al. 2019)
  - Zn: T_{50} = 704K
  - Vaporization sensitive
- Siderophile and chalcophile
  - 68% of BE Cd in the core (vs 32% of the total mass)
  - Useful for study of differentiation
- Long term goal: chondrites

FEW STUDIES UNTIL RECENTLY

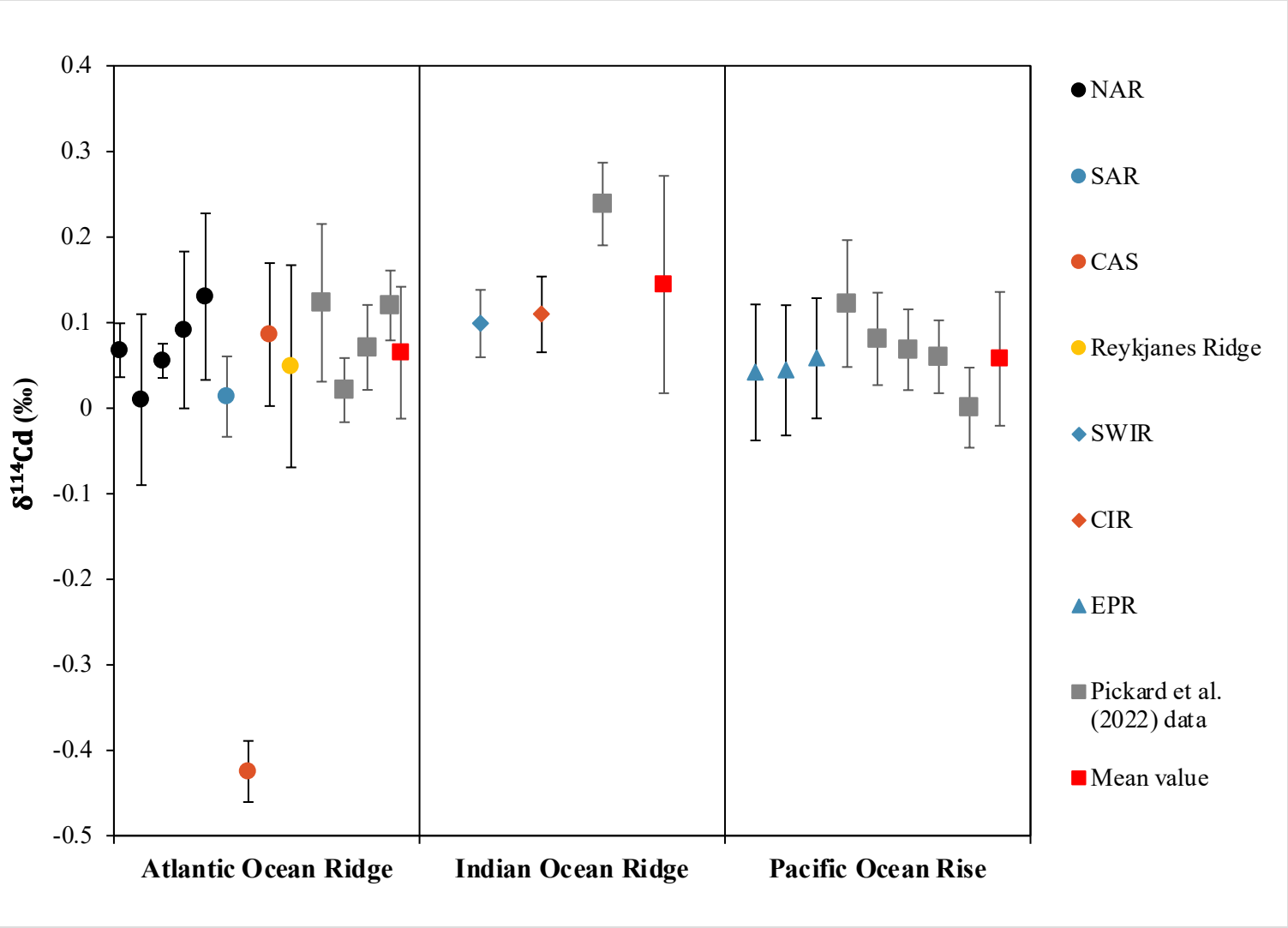
- Low concentrations
  - < 150ppb in most igneous samples
  - A few ppb in tektites, lunar samples and some chondrites
- High matrix / Cd ratio
  - Need extensive purification process
  - Potential experimental isotope fractionation
- Significant interferences: Sn, Zr and Pd (+In, Mo)
  - Sn / $Cd_{basalts}$ ~ 10-30
  - Significant effect if Sn / Cd > 0.001
  - Need to divide Sn concentration by 10 000



Cd concentrations in terrestrial and extra-terrestrial samples

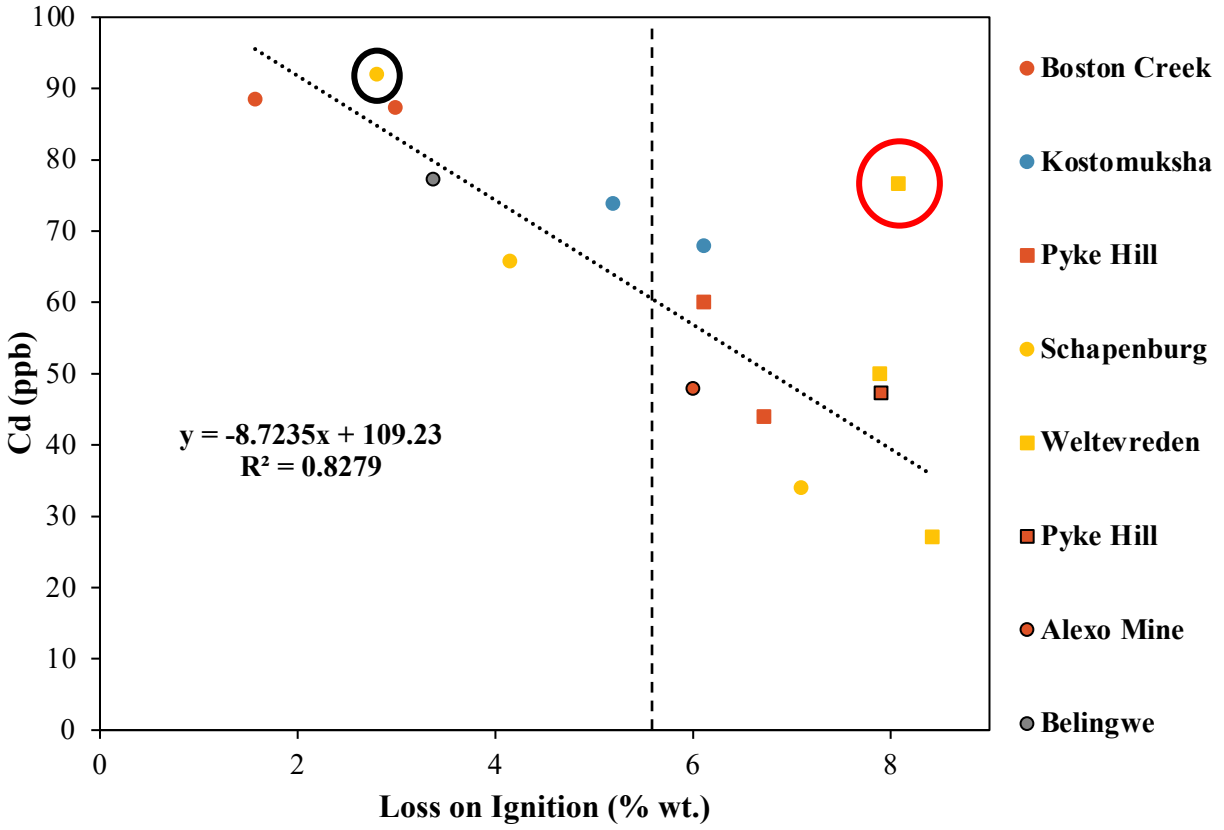
Data from the prsent study, Schediwy et al. (2006), Wang and Lipschutz (2005 and 2007), Wang et al. (2015)

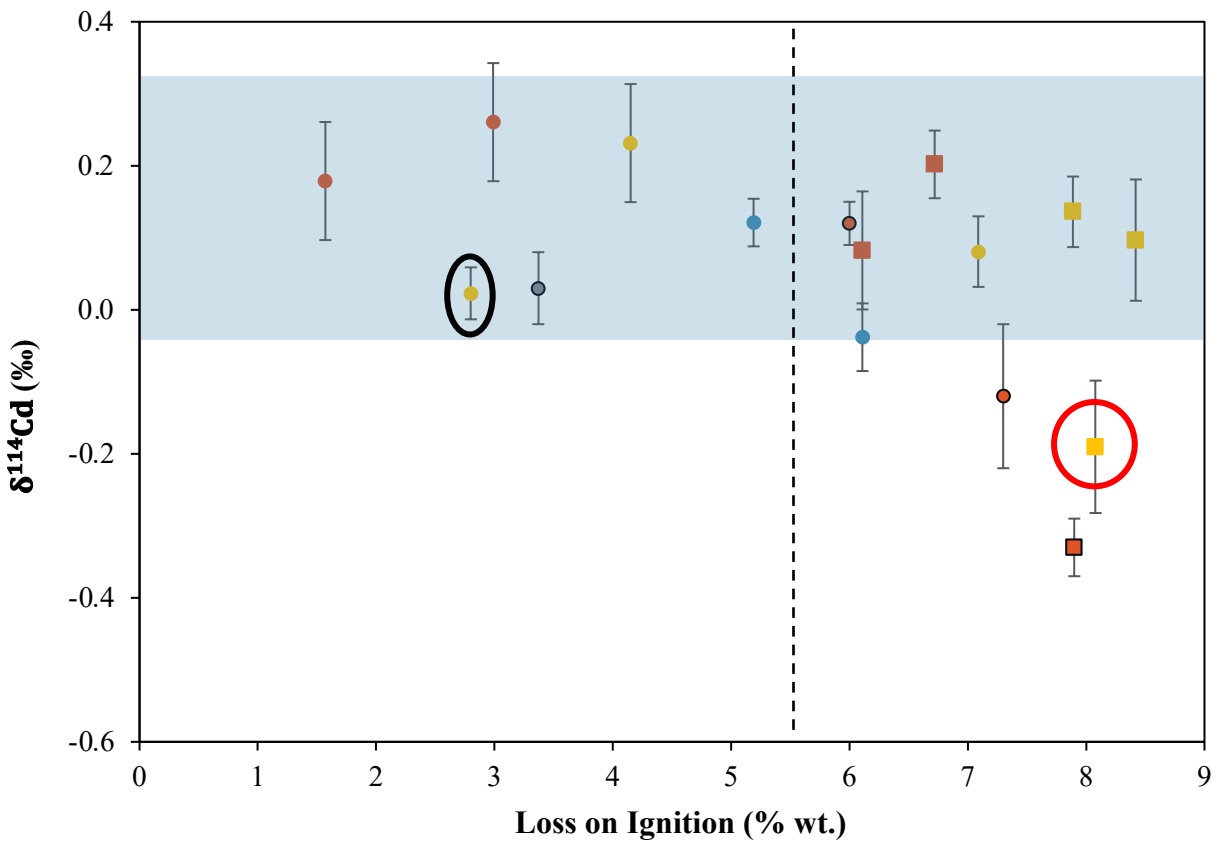
MORB CD ISOTOPE COMPOSITIONS



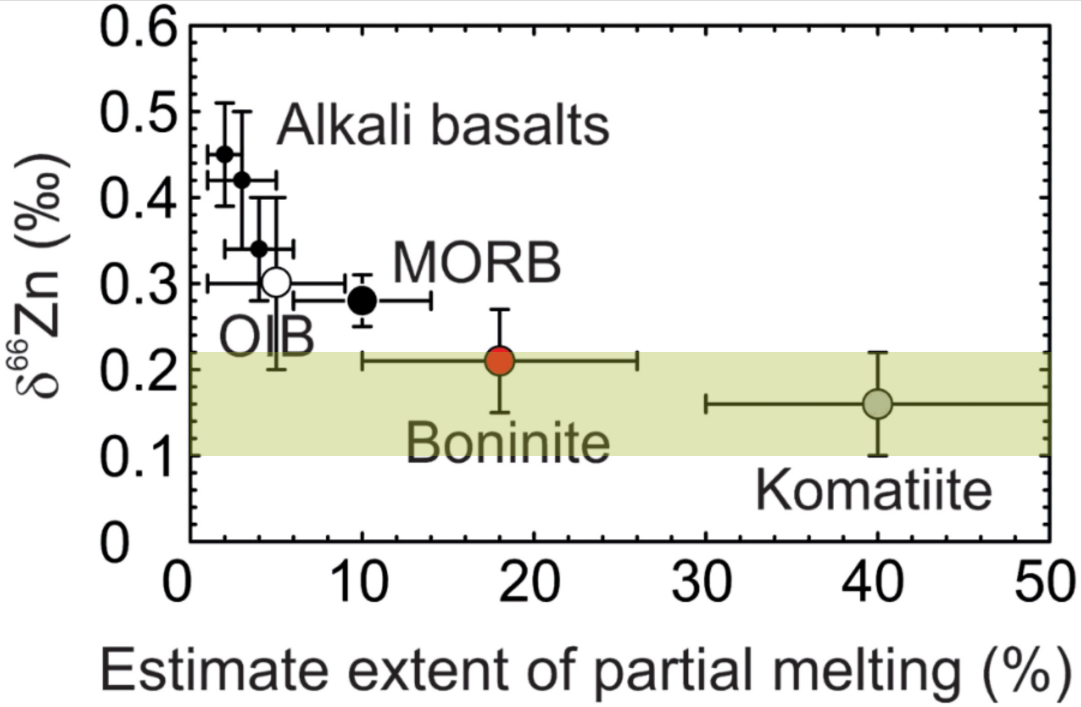
$$\delta^{114}Cd = \left[\frac{\left({}^{114}Cd/{}^{110}Cd\right)_{sample}}{\left({}^{114}Cd/{}^{110}Cd\right)_{standard}} - 1\right] \times 1000$$

THE PRISTINE KOMATIITES PROBLEM

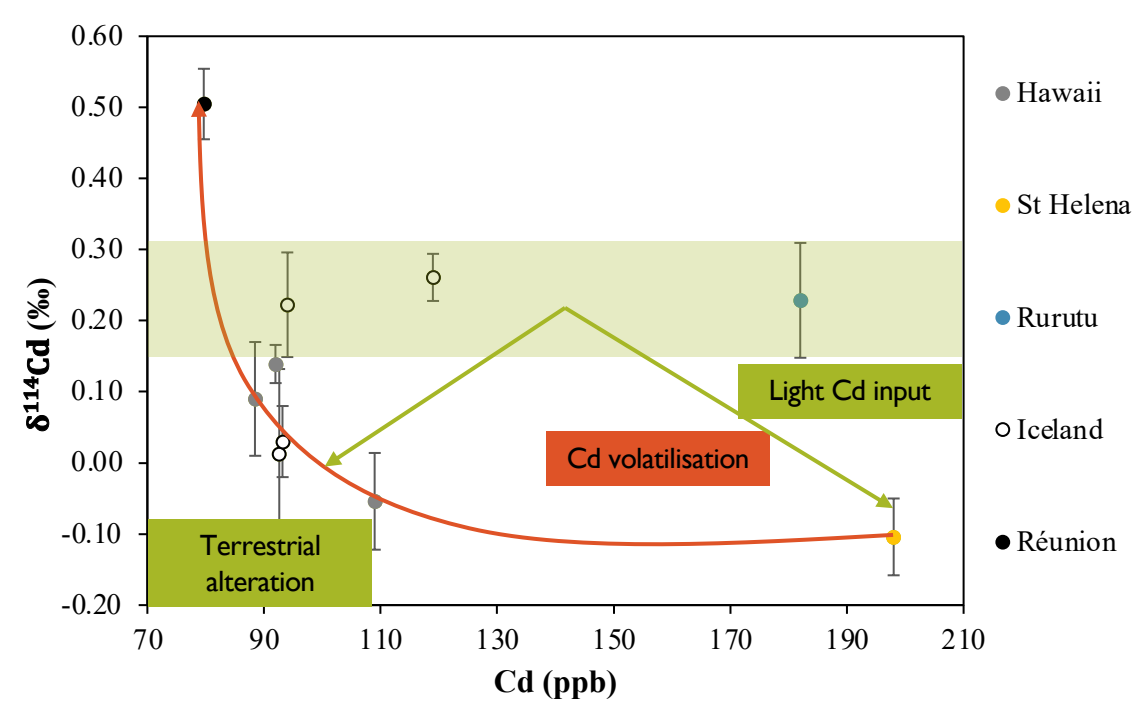




TO (OI)B OR NOT TO (OI)B?

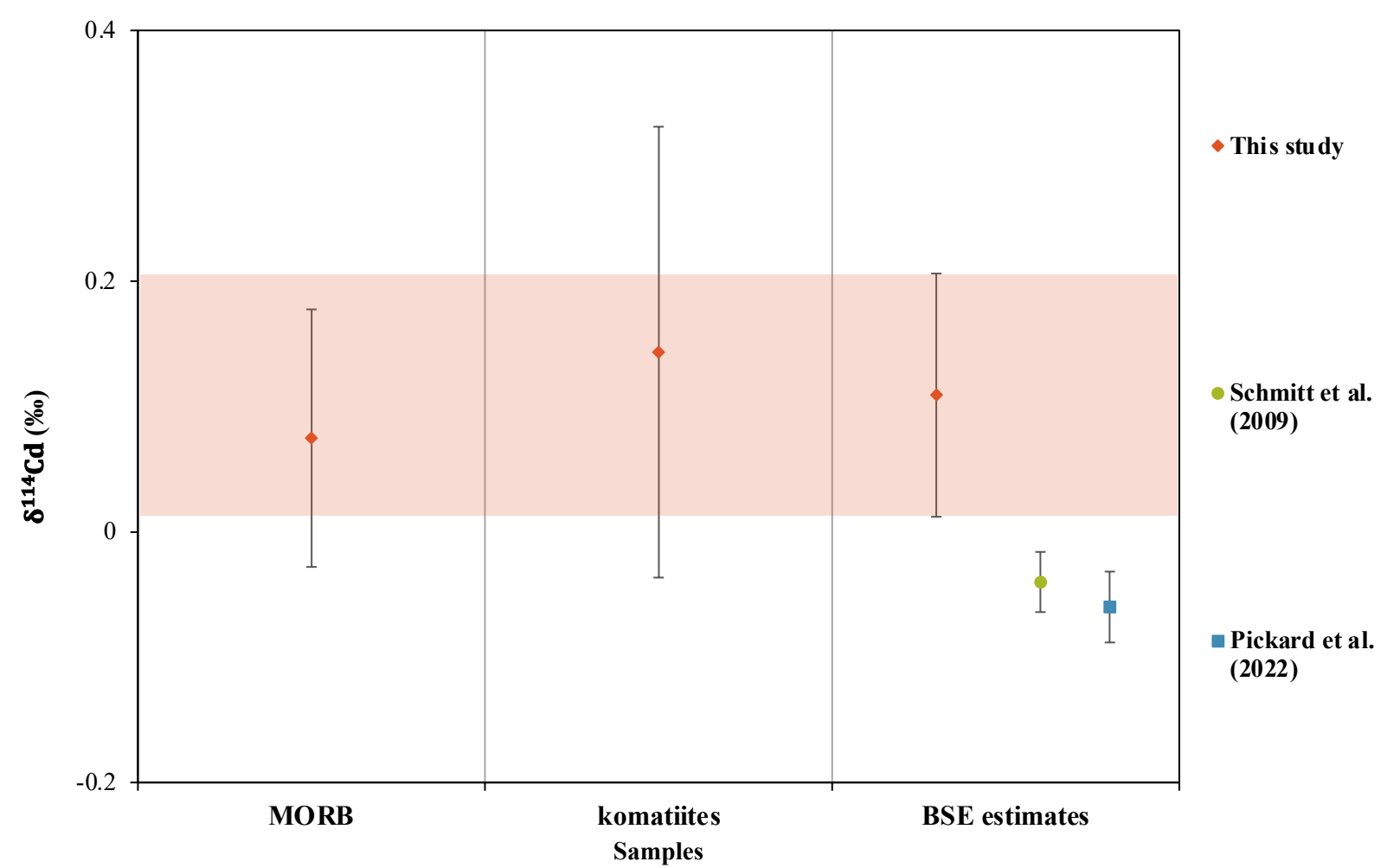


Isotopic variations caused by low degrees of partial melting
Day et al. (2022)

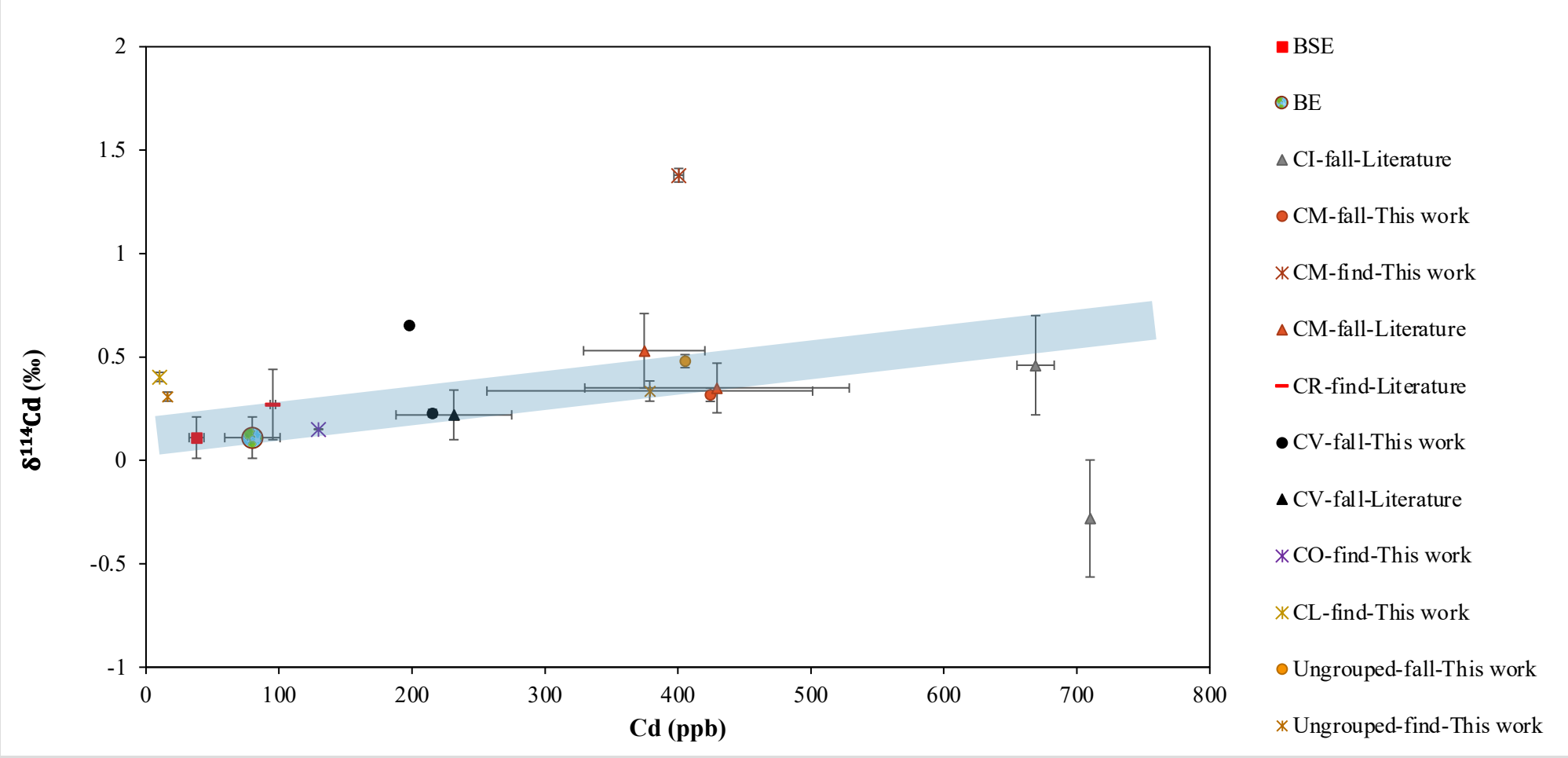


OIB Cd isotope compositions
Data from *Schmitt et al. (2009)* and *Pickard et al. (2022)*

A NEW ISOTOPE COMPOSITION FOR THE BSE

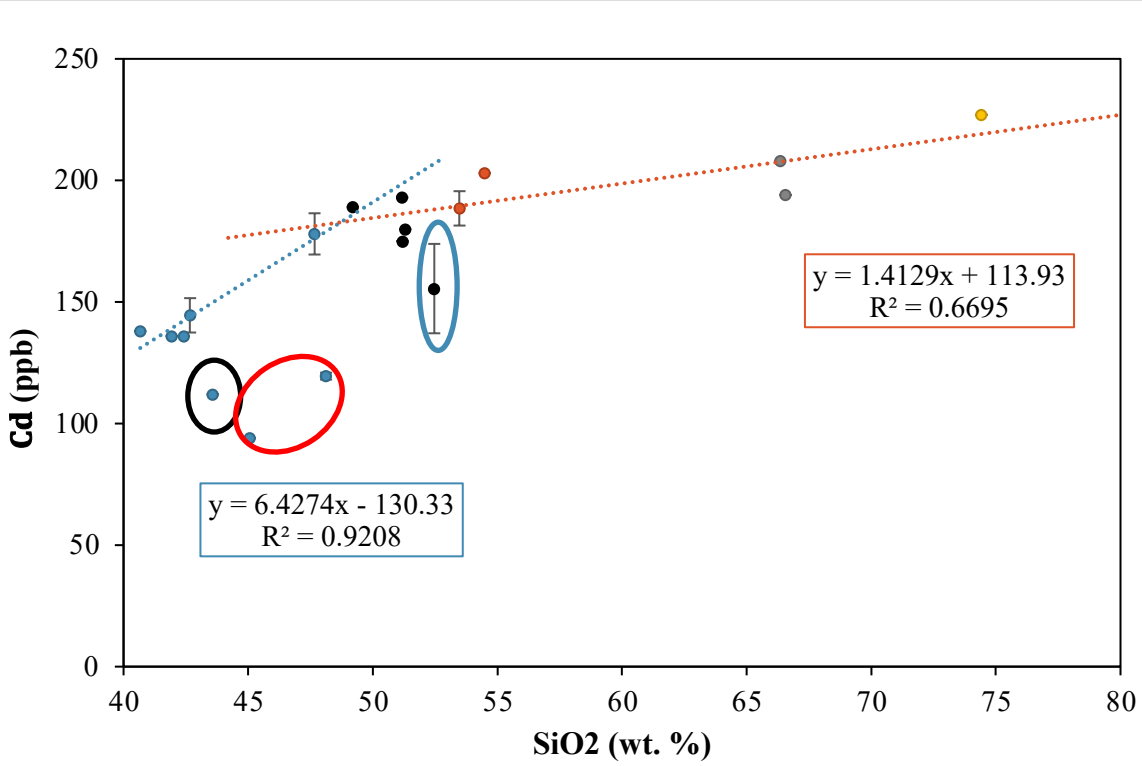


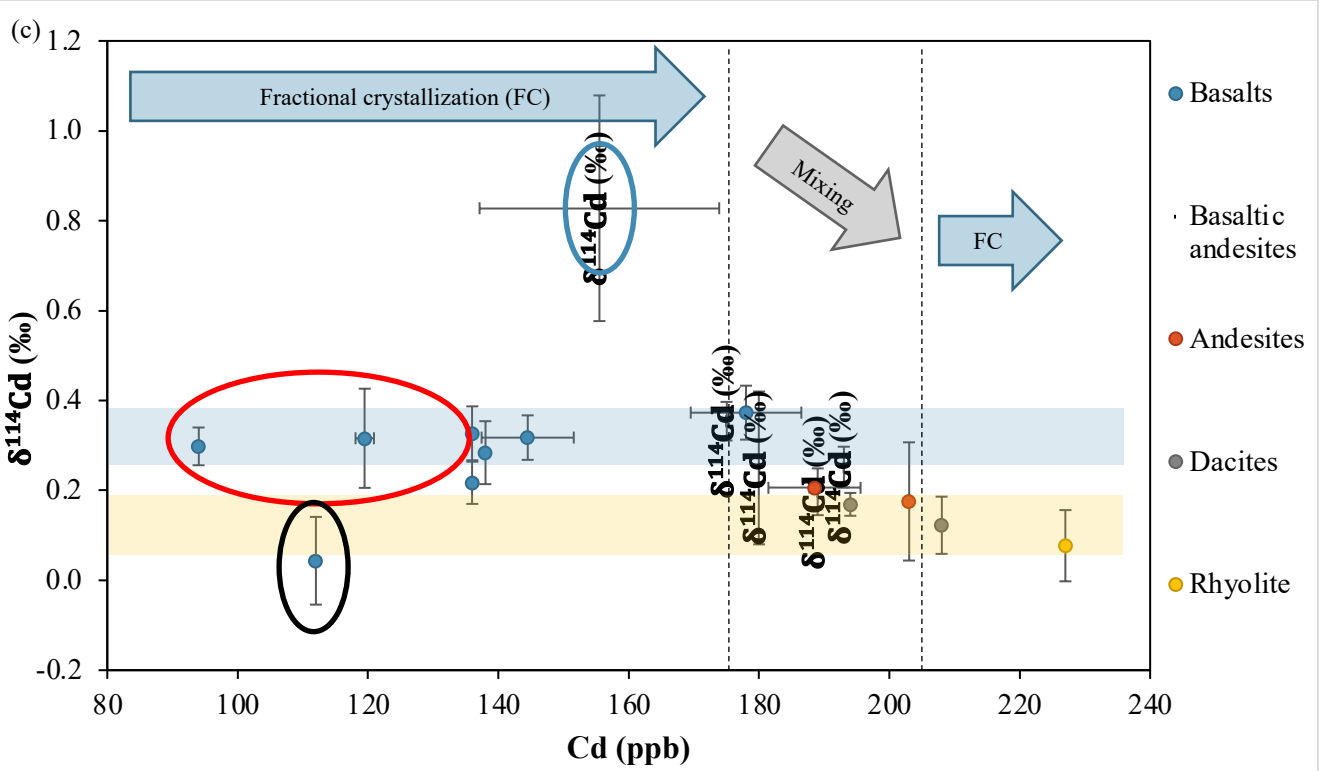
ACCRETING THE EARTH WITH CARBONACEOUS CHONDRITES



THANK YOU

TO (OI)B OR NOT TO (OI)B? - HEKLA





ACCRETING THE EARTH WITH OC AND EC