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Correlated Te, Zn, and Cd Isotopes in Chondritic Meteorites.

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As a moderately volatile element with a condensation temperature of 709 K, Te is prone to isotopic fractionation during both nebular and parent body processes. Tellurium isotope compositions can hence be used to constrain the origin of the volatile element budgets of the Earth and other planetary bodies and the processes that affected the volatile element distribution.

This study utilizes MC-ICP-MS and the double spike technique to investigate the Te stable isotope compositions of a comprehensive suite of meteorites. Additional concentration and stable isotope data for Zn and Cd that were obtained on the same powder aliquots are available for the majority of the samples.

Preliminary results are available for a subset of 15 carbonaceous, enstatite and ordinary chondrites. These reveal Te concentrations that correlate well with both Cd (R^2 = 0.853) and Zn (R^2 = 0.846) concentrations. These correlations are not unexpected as all three elements are either moderately or highly volatile. Furthermore, the $\delta^{130/125}$Te values of the carbonaceous chondrites tend to decrease with decreasing Te concentrations (Fig. 1). This is in agreement with previous studies [1, 2]. However, as noted in [2], the CK meteorite is an exception to this trend, as it has a low Te content coupled with the heaviest Te isotope composition seen in this study. Additionally, the $\delta^{130/125}$Te values of ordinary chondrites decrease with decreasing Te concentration, in the order L>H>LL.

Based on available data, the bulk silicate earth (BSE) has been estimated to have a $\delta^{130/125}$Te value of between about -0.1 and 0.4 [1]. As such, the $\delta^{130/125}$Te value of the BSE appears to be higher compared to CV, CO and CR chondrites but overlaps with the Te isotope compositions of CM and EH chondrites (Fig. 1). This is in accord with previous studies, which argued that Earth's late veneer had a composition akin to CI or CM chondrites [1, 4].

[1] Fehr et al., (2018), *Geochimica et Cosmochimica Acta* 222, 17-33. [2] Hellmann et al., (2020), *Earth and Plantary Science Letters* 549. [3] Pickard et al., in prep. [4] Wang and Becker (2013), *Nature* 499, 328-331.