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**Suppressed cadmium stable isotope fractionation during evaporation into air and CO-CO<sub>2</sub>.**

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Evaporation is commonly assumed to result in kinetic stable isotope fractionation due to the differential velocities of isotopes or isotopologues (Graham's law). Here, Cd isotope compositions were obtained on silicate melt samples from two evaporation experiments that were carried out at ~1300°C and atmospheric pressure using a mechanically assisted equilibration technique.

Stable isotope fractionation during evaporation of Cd into air and CO-CO<sub>2</sub> is strongly suppressed and amounts to only 9% (air) or 1.5% (CO-CO<sub>2</sub>) of the fractionation predicted by Graham's law. The suppression of Cd isotope fractionation is probably due to partial back reaction from the vapor into the melt phase. Since Cd forms a monatomic vapor, evaporation of Cd requires reduction. The faster loss of Cd and the very limited isotope fractionation under more reduced conditions in CO-CO<sub>2</sub> is best explained by pre-reduction in the melt phase. The efficient suppression of isotope fractionation during evaporation questions models that predict much larger stable isotope fractionations for example during the outgassing of planetary bodies.

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Cite abstract as:

Kremser, V., Wombacher, F., Ertel-Ingrisch, W., Dingwell, D.B., et al. (2012) Suppressed cadmium stable isotope fractionation during evaporation into air and CO-CO<sub>2</sub>. Paneth Kolloquium, Nördlingen (Germany), abstract URL: <http://www.paneth.eu/PanethKolloquium/2012/0181.pdf> (abstract #0181).