

# Planetary differentiation causes almost complete degassing of water



- A team of researchers set out to answer the question: “Which type(s) of bodies in the early solar system contained water?”
- The team utilized secondary ion mass spectrometry (SIMS) to measure the **lowest ever recorded** water concentrations in meteorites.
- These results demonstrate that regardless of how much water a planetary body has initially, differentiation into a core and a silicate mantle (i.e. melting) will cause almost quantitative loss of water through degassing due to the high temperatures involved. Once planets reach a radius of >1000km they have sufficient gravitational force to retain an atmosphere and, thereby, water.
- This study suggests that the addition of water to the terrestrial planets (Mercury, Venus, Earth, Mars) could not have occurred while they were smaller than 1000km in radius.

