



## **The isotopic composition of H<sub>2</sub> from biomass burning - dependency on combustion efficiency, moisture content and dD of local precipitation**

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Differences in isotopic composition between the various sources of H<sub>2</sub> are large, but only few measurements have been carried out to constrain them. For biomass burning, the values quoted in the literature are based on few combustion experiments, which were then extrapolated to the global scale based on a number of assumptions. One of these assumptions is that the isotopic composition of H<sub>2</sub> should scale with the isotopic composition of the precipitation at the location where the biomass grew. Here we test this hypothesis using 18 wood samples collected from various locations around the globe. The sample locations cover a range in dD of precipitation from below -120 permil in Siberia and Canada to -15 permil in Zimbabwe. The results confirm the predicted linear relation with dD of the precipitation in the sampling region. The water content itself is found to at most slightly affect the results. Furthermore, dD of H<sub>2</sub> depends on combustion efficiency. Thus, the isotopic composition of H<sub>2</sub> from biomass burning shows a strong variability around the globe, and between different stages of a fire. It is suggested that this variability, rather than a global bulk number, should be incorporated explicitly in global models that attempt to reproduce the spatial and temporal distribution of dD in H<sub>2</sub>.