High water content in primitive continental flood basalts

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CFB is in principle caused by an abnormally high temperature, extended decompression, a certain amount of mafic source rocks (e.g., pyroxenite), or an elevated H_2O content in the mantle source. However, there is currently no convincing evidence of high water content in the source of CFB. We retrieved the initial H_2O content of the primitive CFB in the early Permian Tarim large igneous province (NW China), using the H_2O content of the early-formed clinopyroxene (cpx) crysts and the partition coefficient of H_2O between cpx and basaltic melt. The arc-like H_2O content (4.82±1.00 wt.%) provides the first clear evidence that H_2O plays an important role in the generation of CFB.