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Water as a flux in a hybrid coordination network glass

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Hybrid coordination network (HCN) glasses, including for example metal-organic framework glasses, consist of metal ion nodes connected by organic linkers through coordination bonds, in many cases resembling the short-range structure encountered in oxide glasses. However, while the properties of oxide glasses may be significantly changed by adding so-called network modifiers, i.e., metal oxides which break up the interpenetrating network by creating non-bridging oxygens, this phenomenon has not yet been observed in HCN glasses. Here, we present evidence for water acting as a flux or "modifier" in a HCN glass. Specifically, upon water addition to the parent crystal, the melting and glass transition temperatures decrease, before reaching a constant value at high water content. We investigate the water-facilitated melting and glass-formation mechanism by calorimetry, spectroscopy, and *ab initio* simulations, showing how water is incorporated into the network structure and its effect on the measured thermal properties. Our work sheds light on how some HCN glasses mimic the flux behavior of oxides, providing an important path for tuning their glass formation propensity and resulting material properties.