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Interplay between frustration, magnetism and sodium vacancy ordering in in $Na_{0.84}$ CoO2 STANISLAW GALESKI, KURT MATTENBERGER, BERTRAM BATLOGG, Laboratory for Solid State Physics, ETH Zurich, Switzerland — We have performed an extensive survey of low temperature specific heat of $Na_{0.84}\,CoO_2$. Heat capacity measurements were performed with an AC steady state method using a membrane nanocalorimeter. Thanks to the 10-30 nanogram sample mass we were able to perform well controlled ultra-fast cooling (500k/s) form high temperatures to temperatures where the sodium ions become immobile. This allowed us to take snapshots of different high temperature sodium configurations, relate them to particular structural transitions and at the same time establish their influence on the low temperature magnetic order. Through correlation with XRD data we demonstrate that the least ordered sodium configuration increases the Tc of the 22K transition by 2K.

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