*** Electronic Supplementary Information***

All-day passive radiative cooling using common salts

Mariana Desireé Reale Batista, Alyssa L. Troksa, Hannah V. Eshelman, Michael Bagge-Hansen, John D. Roehling[*]

Materials Science Division, Lawrence Livermore National Laboratory, 7000 East Ave. Livermore, CA, 94550, USA

E-mail: roehling1@llnl.gov

Figure S1 shows a close-up optical image of the salt foam panel (SFP) with the encapsulating PE sheet around the plastic mechanical support frame.

Figure S1. Optical image of the SFP.

Figure S2 shows scattering calculations based on work described elsewhere.[1] This reveals that features smaller than approximately 500 nm are required to achieve sufficient IR transmission for a 1 cm thick layer (~70% over atmospheric window).

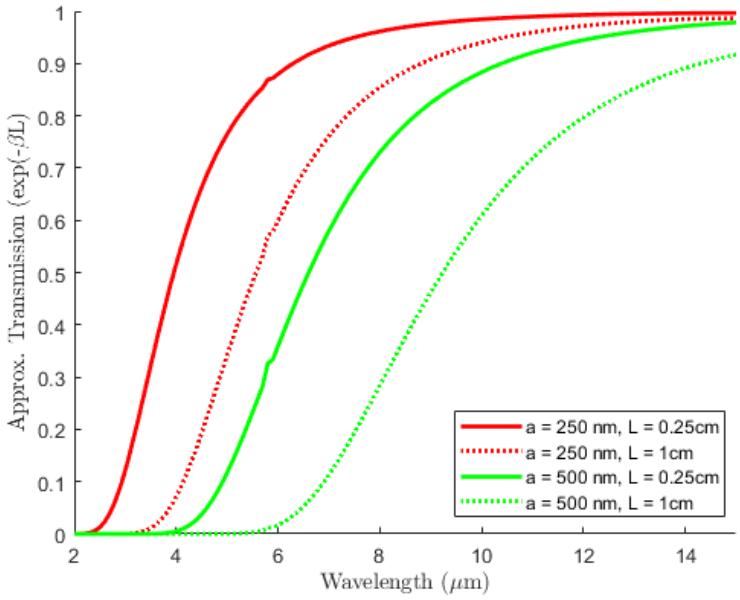

Figure S2. Scattering calculations for a NaCl foam with a uniform feature size and different thicknesses.

Figure S3 shows the change in structure due to concentration changes and the addition of TBA. A comparison of KCl foams is also shown. Note the dense structure of the 6M foam becomes much more open when the concentration is decreased to 0.6M. The addition of TBA distributes the structure to fill in the large pores that are present without TBA. The KCl foam structure closely resembles the NaCl structure.

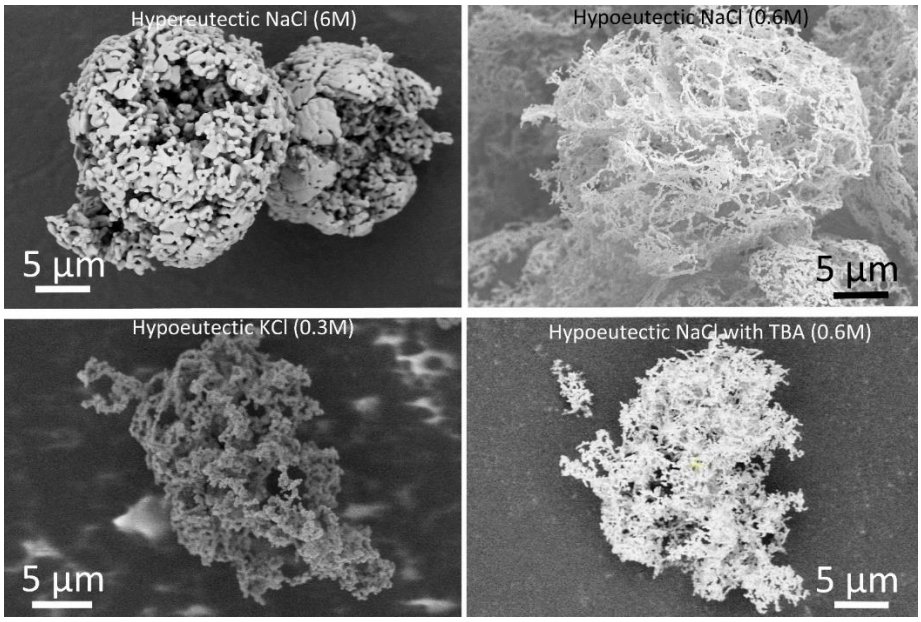

Figure S3. SEM of hypereutectic NaCl (top left) and hypoeutecic NaCl (top right) and hypoeutectic NaCl made with TBA (bottom right). Also shown is an SEM image of hypoeutecic KCl foam.

Figure S4 shows the performance of the SFP in a non-optimal area with surrounding buildings and trees. On this multiday test (2022 May 24-25th) the humidity increased to over 75% and the SFP continued to cool the underlying substrate. At 9:00 AM on May 25th a second SFP, with 1.5 cm thickness was added to the uncovered black paint, resulting in rapid cooling. However, it was unable to outperform the 1 cm thick SFP because of reduced IR transmission.

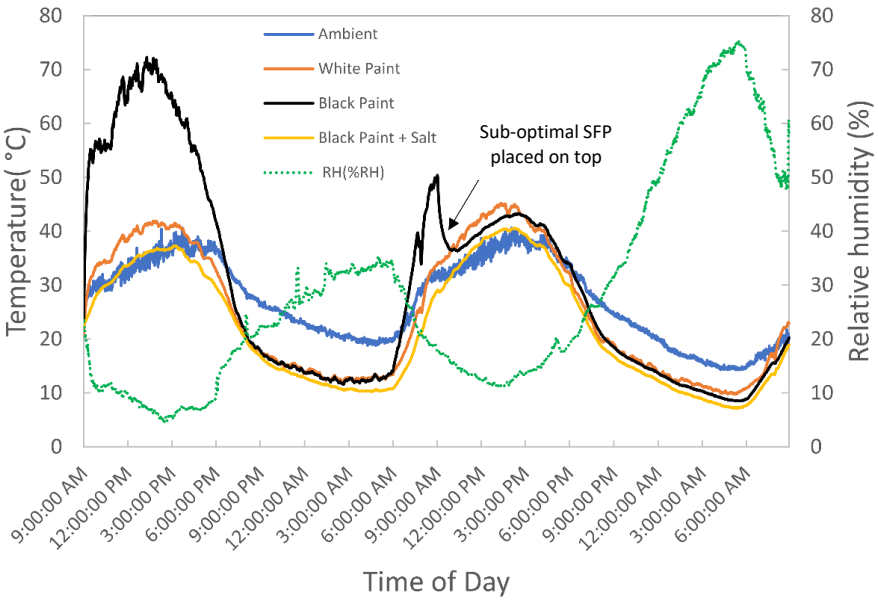

Figure S4. Outdoor testing of SFP in a non-optimal area with surrounding buildings and trees on 2022 May 24-25th. Testing was performed with salt foams with a high concentration of 0.01 M $Na_4Fe(CN)_6$ added resulting too much in parasitic heating during the day.

Figure S5 shows the optical reflectance of salt foams prepared with differing amounts of ferrocyanide. Higher concentrations (0.01 M and above) increased the absorbance (around 350 nm), leading to parasitic heating of the SFP and degraded cooling performance during the day. The moisture resistance was not improved by using higher ferrocyanide concentrations.

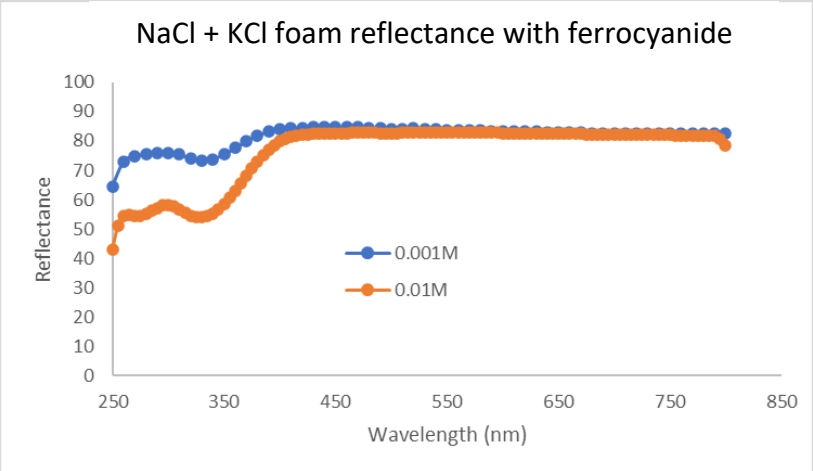

Figure S5. Visible reflectance of salt foams with different amounts of $Na_4Fe(CN)_6$ added to the salt solution.

References

1. H. Kim and A. Lenert, *J. Opt.*, 2018, **20**, 084002.