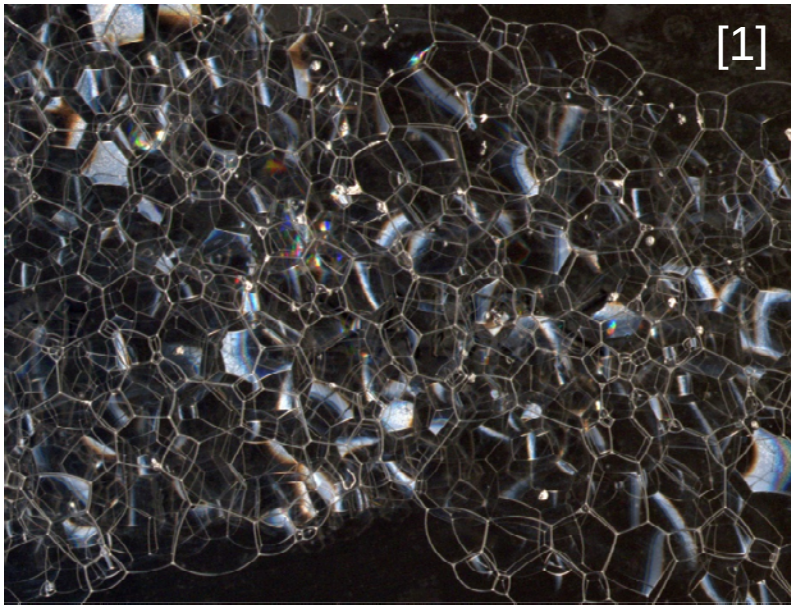
Capillary foams are a new type of colloidal soft matter discovered by Professors Carson Meredith and Sven Behrens, and graduate student Yi Zhang. [Angew. Chem. **2014**, *53*, 13385]

Background Foams are everywhere. These dispersions of gas in liquid are an important arrangement of matter in nature, industry and commercial products.

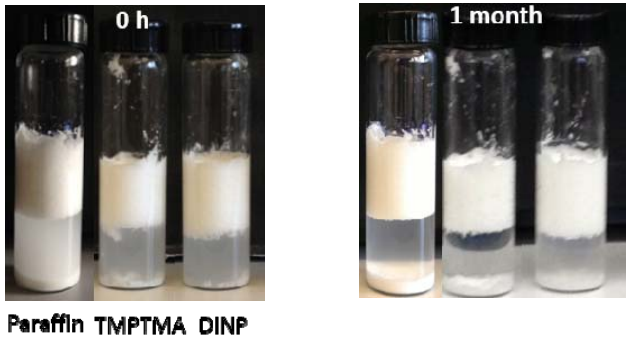


Traditional surfactant-based foams are usually not tolerant to oils, limiting their applications in separations processes and advanced materials.

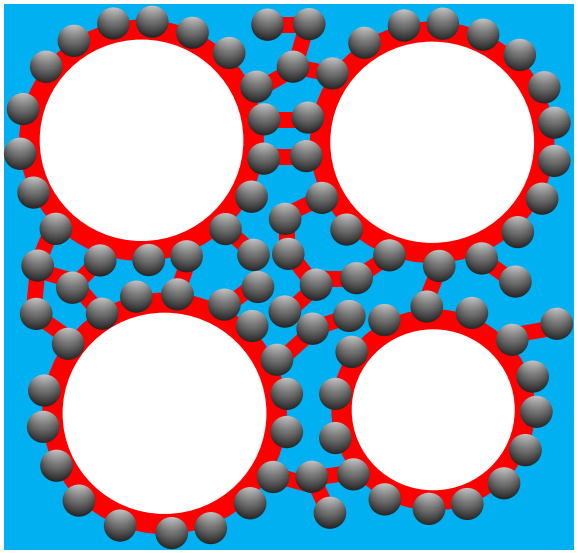
Additionally, surfactants can desorb from interfaces and some harm the environment. This has led us to consider new ways to create foams.

In contrast, capillary foams are formed from water, gas (air), particles and a small amount of immiscible oil.

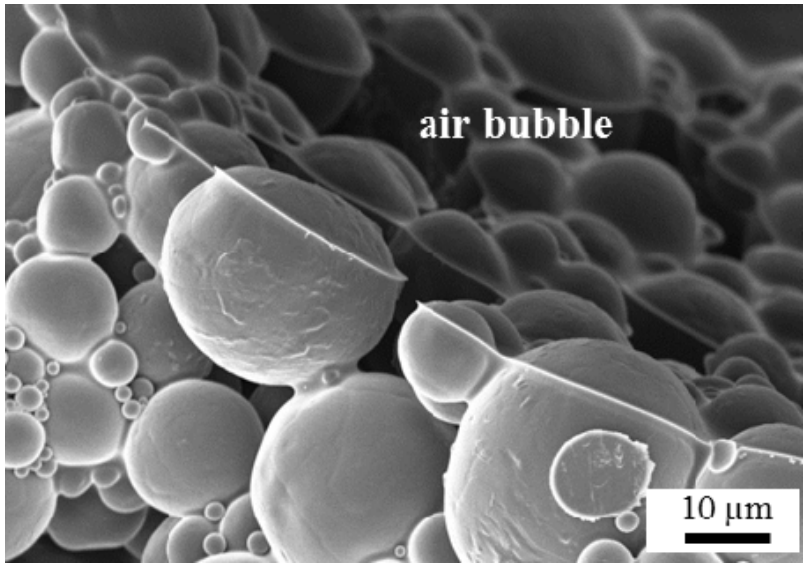
The **structure** of capillary foams consists of two unique features that provide for unusual stability and enable incorporation of oil phases within foams.



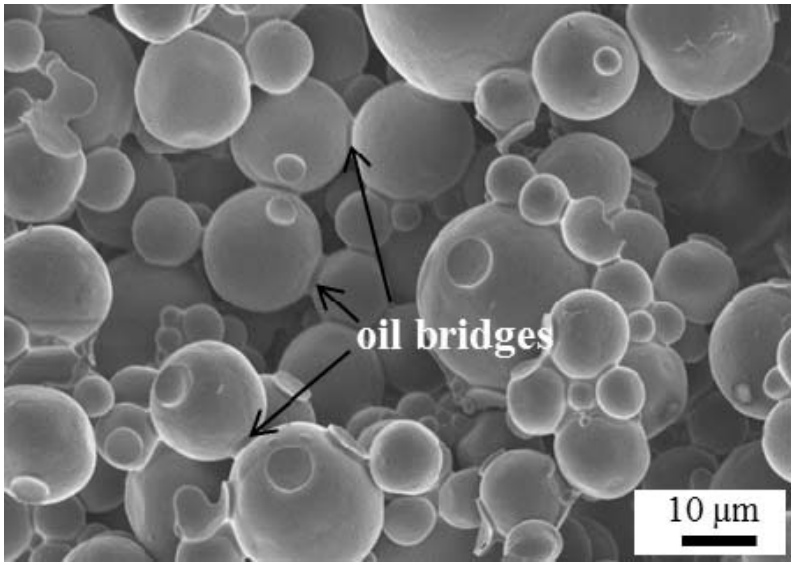
Capillary foams formed from PVC suspensions frothed in the presence of three types of oils.



Structure 1: particle-assisted spreading of oil layer around the bubble

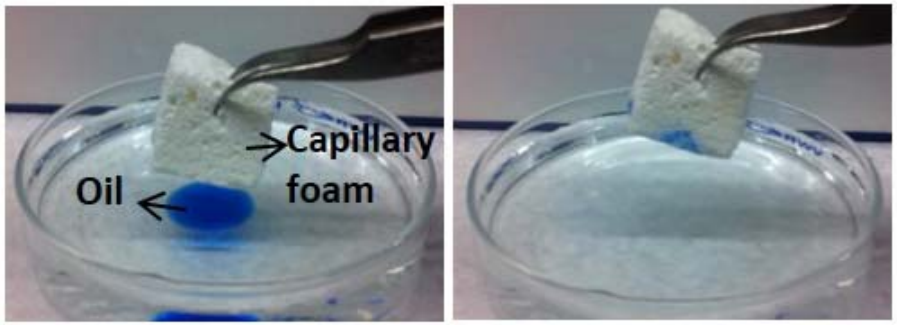


Structure 2: a **network of oil-bridged particles** connecting between bubbles

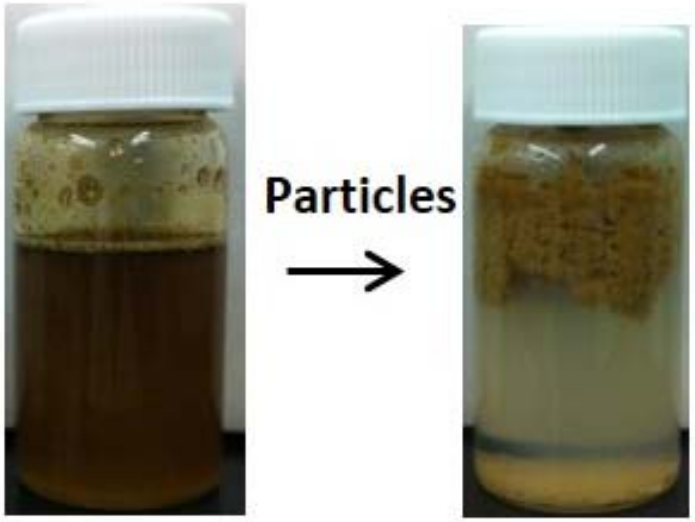


Applications of capillary foams

Oil Spill Cleanup (solid foam)



Oily Wastewater Cleanup (liquid foam)



Porous materials loaded with functional ‘oil’ phases (dyes, pharmaceuticals, etc.)

[3]

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Image References

[1] https://upload.wikimedia.org/wikipedia/commons/thumb/f/f4/Foam_-_big.jpg/1200px-Foam_-_big.jpg
[2] https://upload.wikimedia.org/wikipedia/commons/e/e3/Sea_foam_at_Ocean_Beach_in_San_Francisco_-1_on_3-25-11.jpg
[3] Y. Zhang, H. Wang, S. H. Behrens, J. C. Meredith, *Langmuir* **2015,** *31*, 2669.