

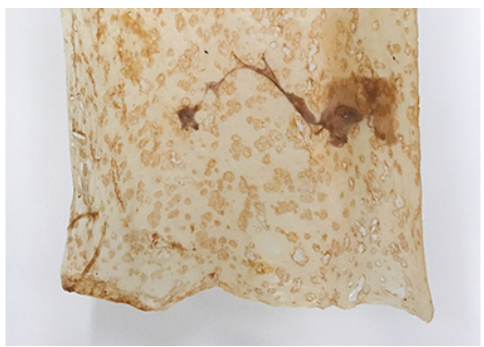
Above: Diapers made out of bacterial cellulose (BC)
Photo by B. R. Molloy

a fresh start and a cool finish

Sorbit Diaper

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Left: Dry NaOH treated BC
Top Right: Wet citrius grown BC
Bottom Right: Dry citrius grown BC

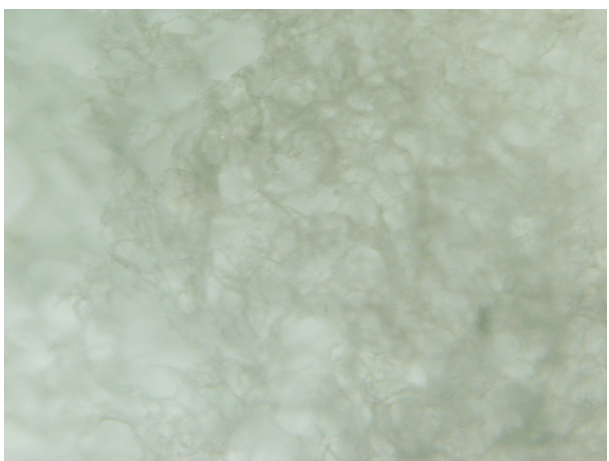
SCOBY

*Symbiotic Colony
Of Bacteria and Yeast*

Bacterial cellulose (BC) is produced by a SCOBY growing at the air liquid interface of a fermentation media. Microorganisms and other contaminants are removed from the BC by treatment with food-grade NaOH and water washes.

Aerogel

*"synthetic porous ultralight material derived from a gel"*³

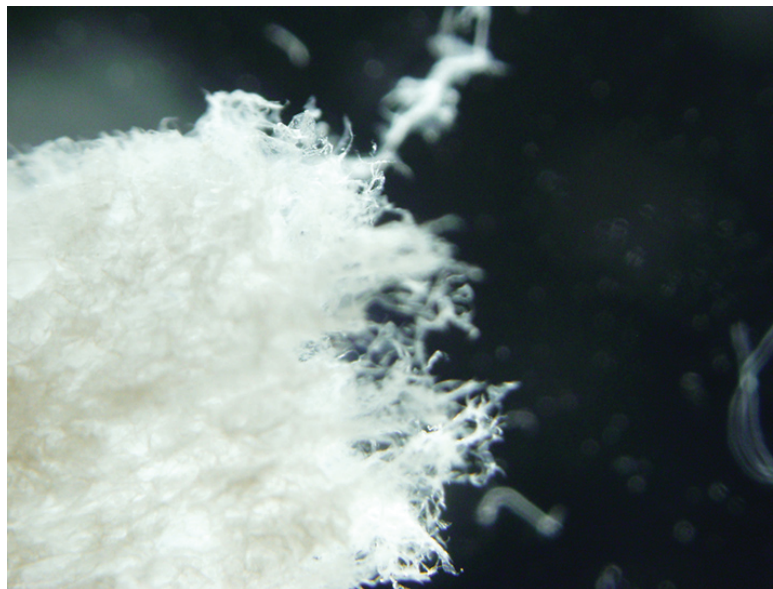
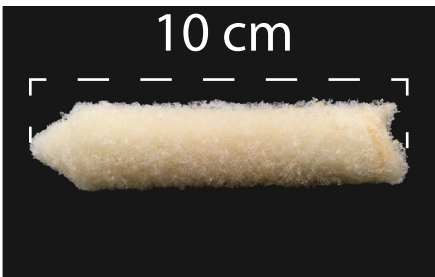
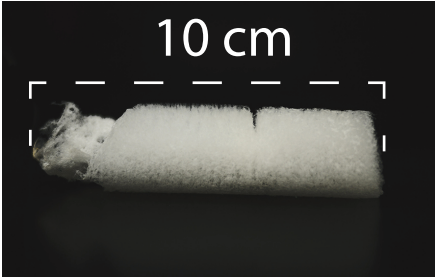


Above: Aerogel under microscope

Properties of an Aerogel

- ultra-light solid
- absorptive
- light weight
- flexible
- soft

Left Top: aerogel made from NaOH treated BC
Left Bottom: aerogel made from citrius grown BC
Right: from a teared aerogel under a microscope



Applications of an Aerogel

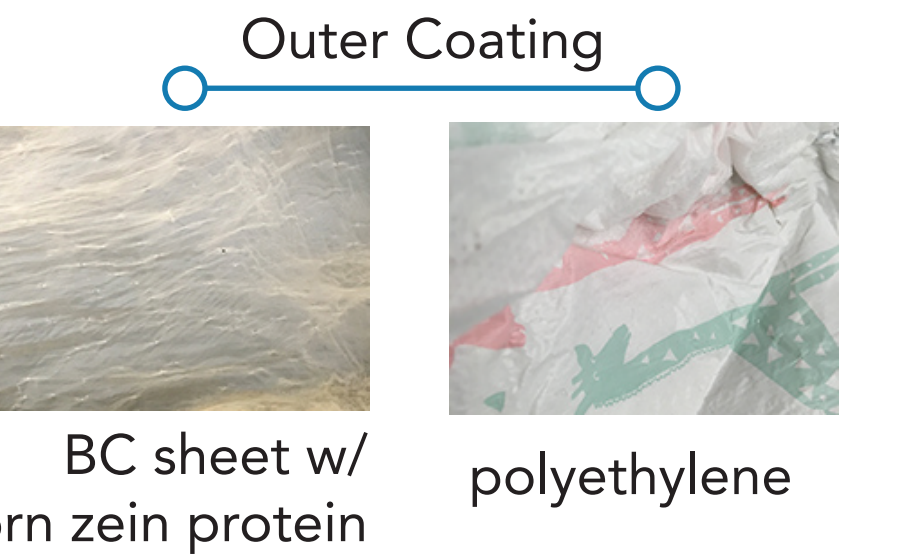
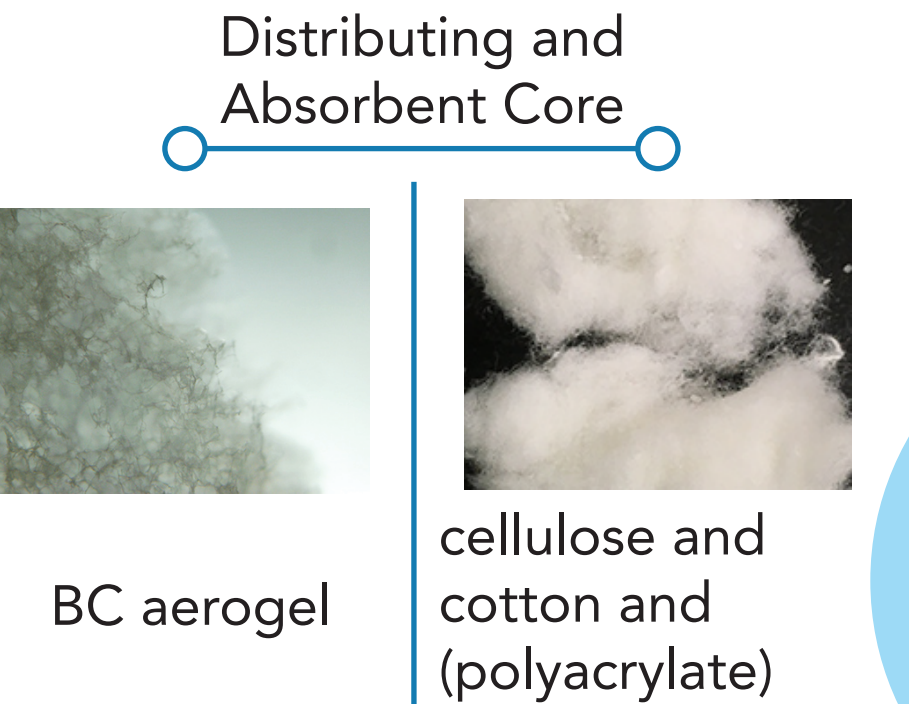
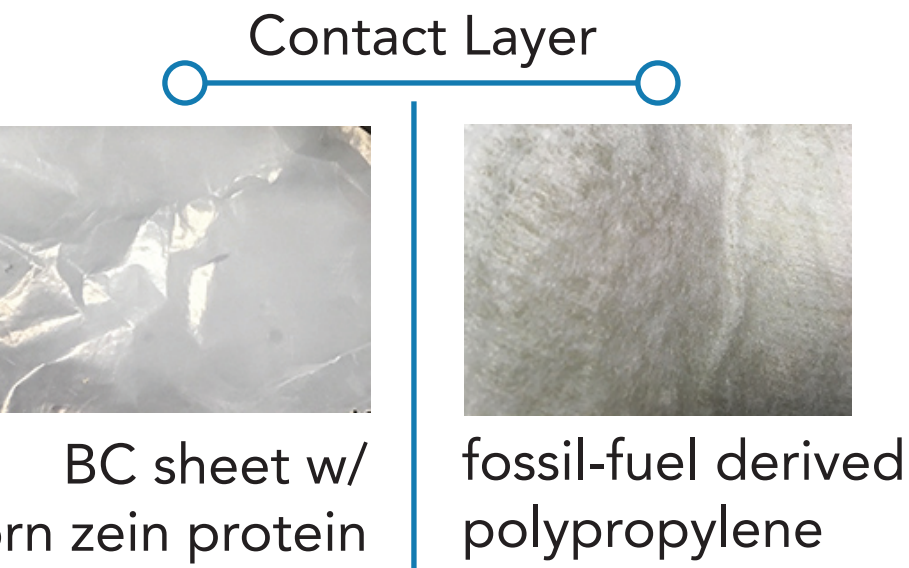
- Bandages
- Pads
- Diapers
- Kitty Litter

Works Cited

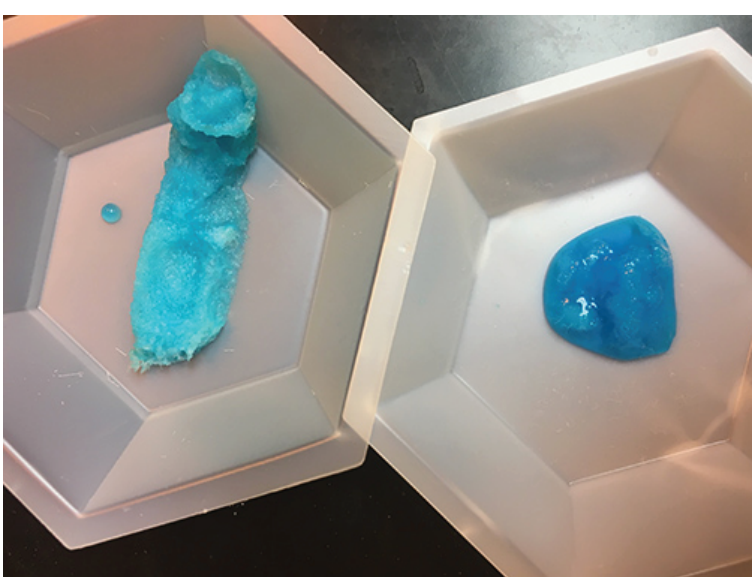
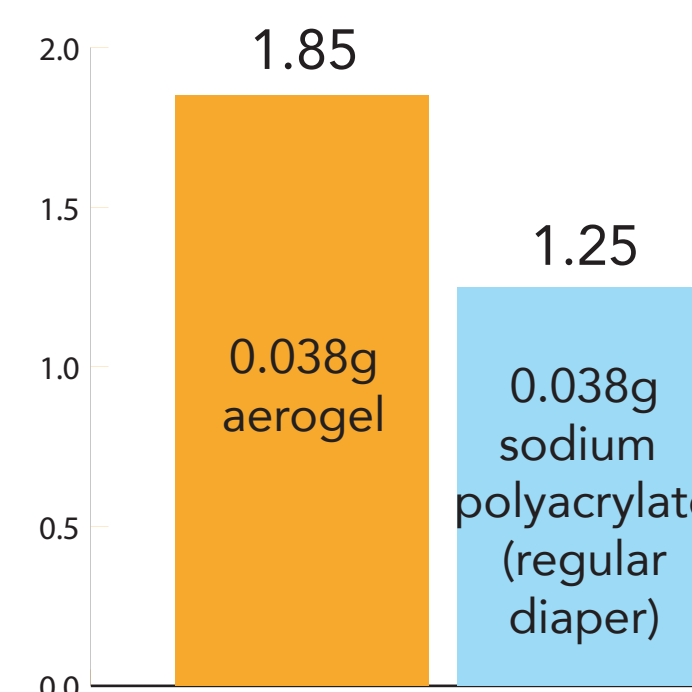
1. Parker, Dianne. "Plastics." Marine Debris Program Office of Response & Restoration, National Oceanic & Atmospheric Administration, 18 July 2013, marinedebris.noaa.gov/info/plastic.html.
2. based on a small sample survey we conducted
3. <https://en.wikipedia.org/wiki/Aerogel>
4. Riley, Lindsey. "Bump Watch: 'Disposable Diapers Are the Third Largest Contributor to the Landfill'." KMTR, 25 Mar. 2014
5. Environmental Protection Agency, 1998

Layers of a Diaper

Sorbit Regular



Absorbency



Above: Comparison of aerogel (left) and sodium polyacrylate (right)

A baby uses over **7,200** over diapers during pre-potty training stage⁴

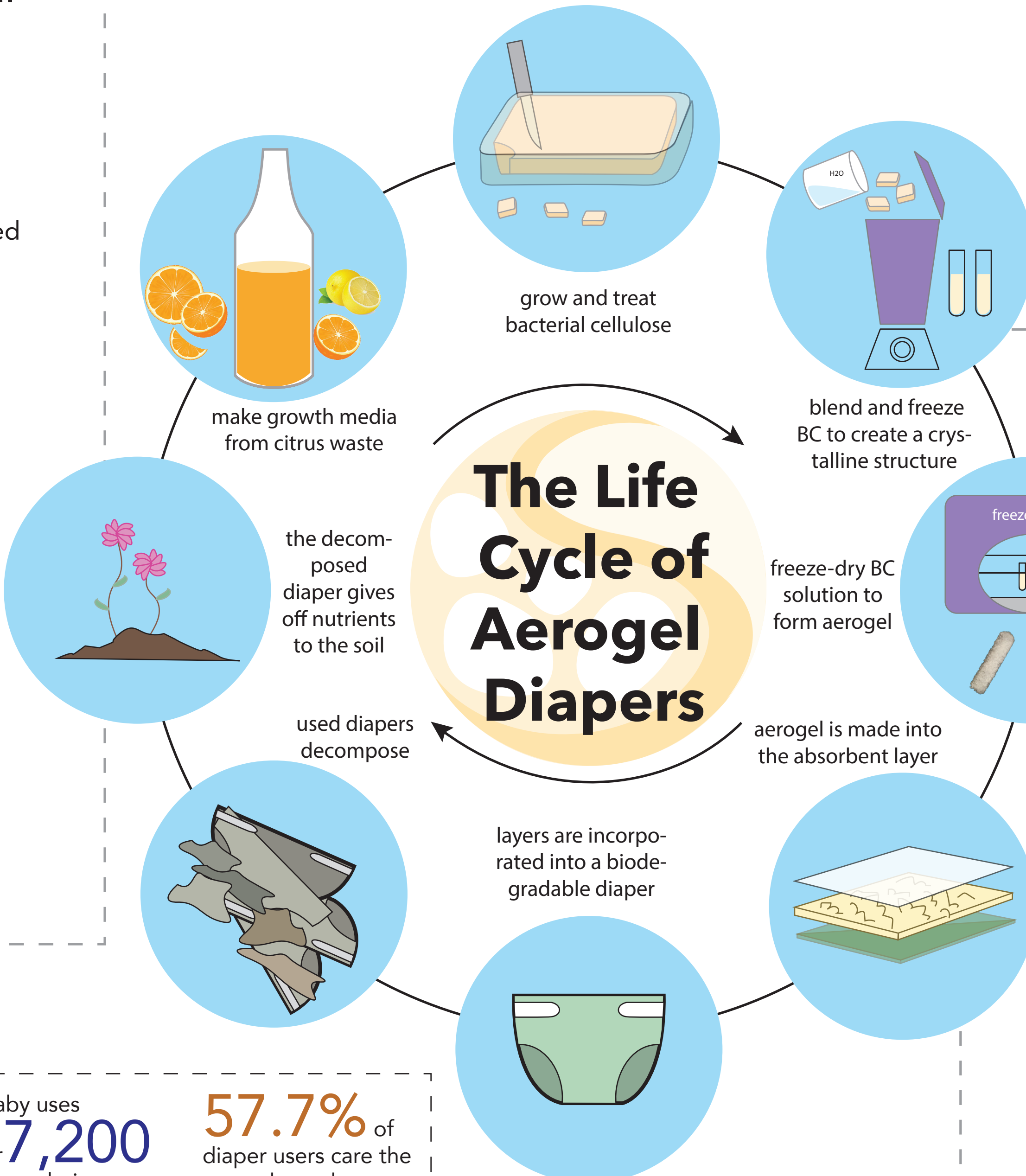
Diapers contributed **2.1%** waste in the US⁵

It takes about **450** yrs for one diaper to decompose¹

57.7% of diaper users care the most about the materials the diaper is made of²

88.5% of diaper users want to know more about BC diapers²

Aerogel is **32.4%** more absorbent than polyacrylate of the same weight



The Life Cycle of Aerogel Diapers

Environmental Impact

By implementing bacterial cellulose sheets and aerogel for all the functional layers of the diaper, plastic waste is reduced. Alternative options for disposal, such as composting, could decrease long term accumulation impact in landfills. In addition, the extremely low weight may lower overall carbon footprint in transportation. Since Sorbit diaper is made from biological materials, it is superior to conventional diapers in terms of biodegradability.