

# Gelation of Crude Oil

**Britain Bruner**

**April 16, 2015**

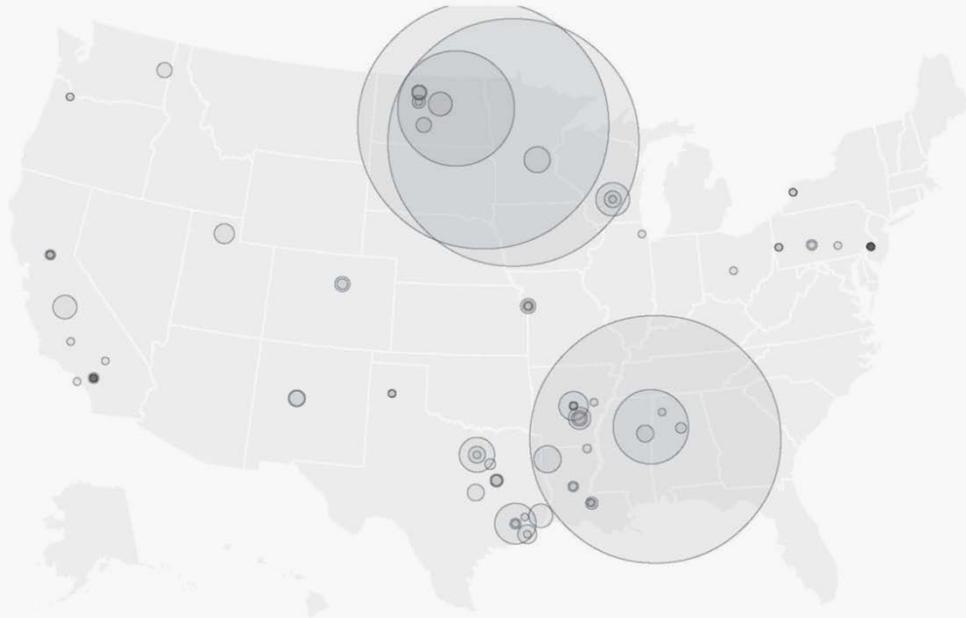
**US/DOT, Washington DC**



# Background (Problem)

## Crude oil spills on U.S. railroads

From federal data showing locations, dates and amounts of oil spilled from trains, 1975 to 2013.

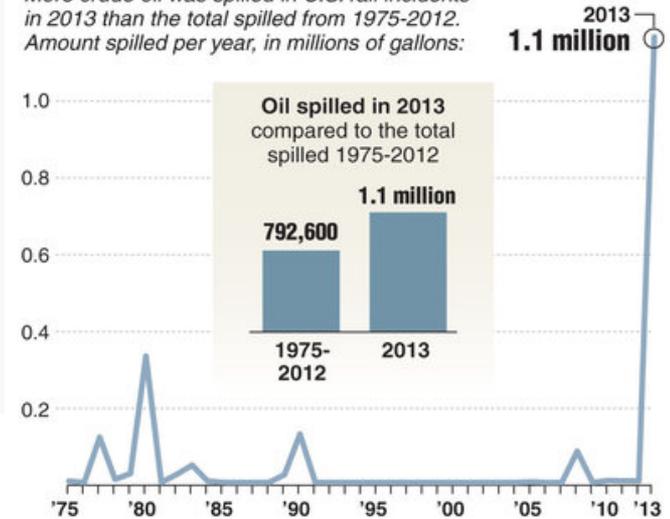


**Media Attention and Cost of Spills Up**

**Train Accidents Down**

## Spike in oil spills from trains

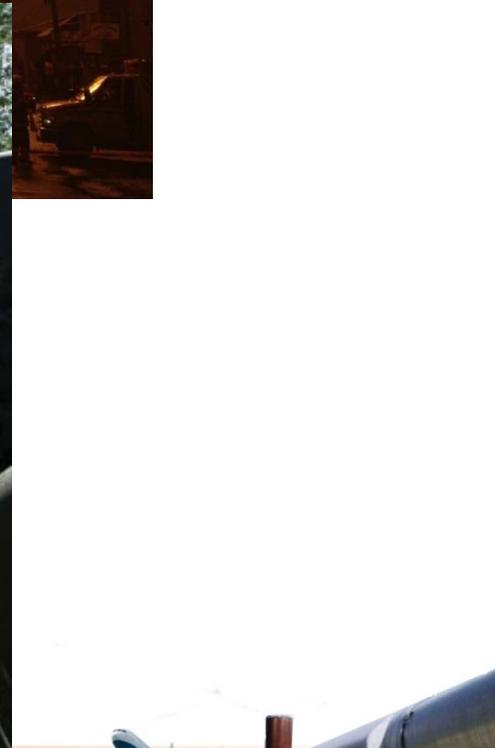
More crude oil was spilled in U.S. rail incidents in 2013 than the total spilled from 1975-2012. Amount spilled per year, in millions of gallons:



Source: U.S. Pipeline and Hazardous Materials Safety Administration  
Graphic: Judy Treible

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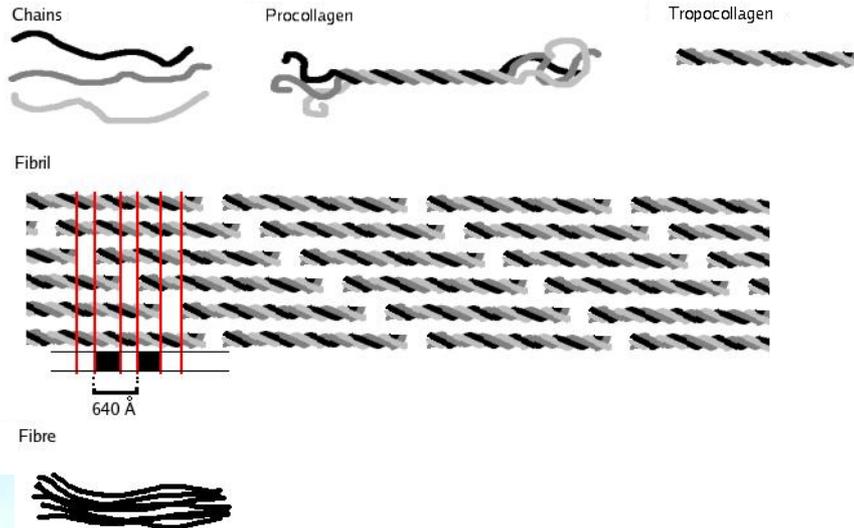


U.S. Department of Transportation  
Pipeline and Hazardous Materials  
Safety Administration

To Protect People and the Environment From the Risks of  
Hazardous Materials Transportation



# Proposal (Solution)

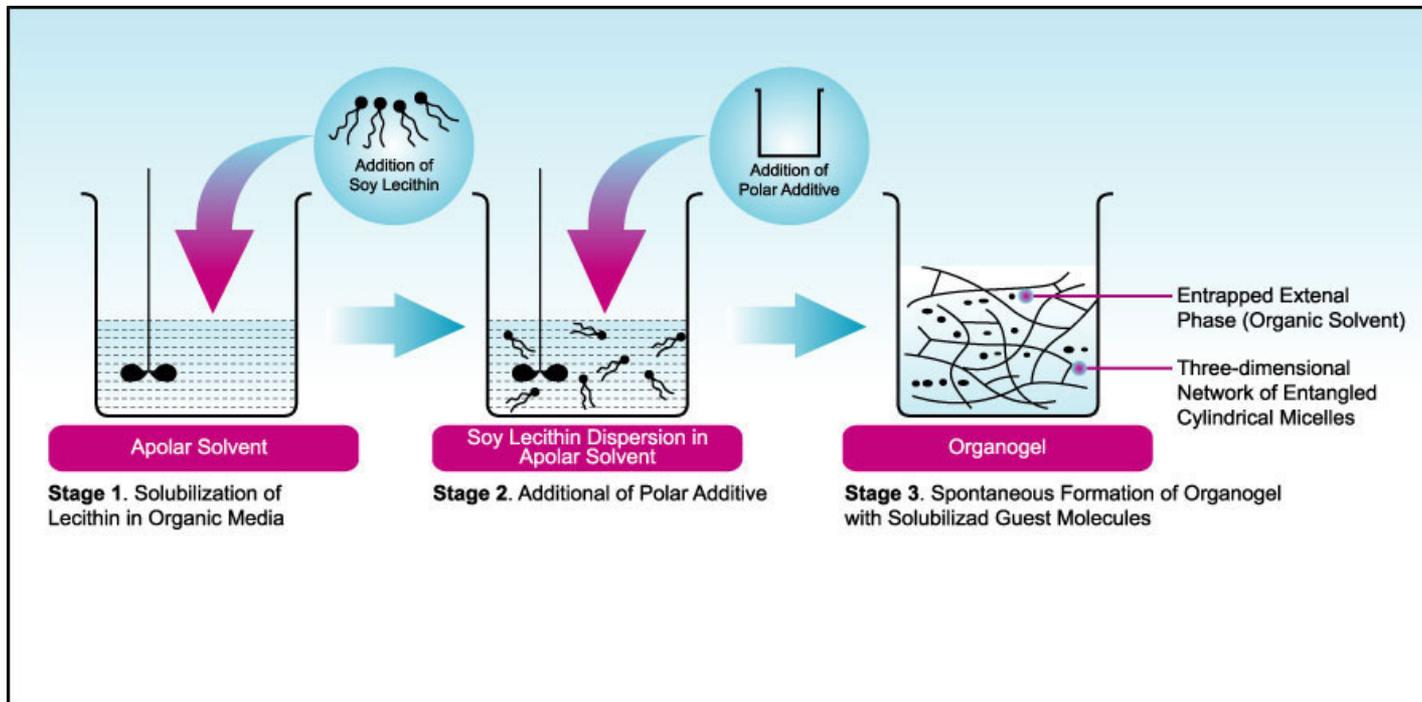


## Hydrogel uses in industry

- Cosmetics (collagen injections)
- Medicine (drug delivery, wound repair, monitoring)
- Food Science



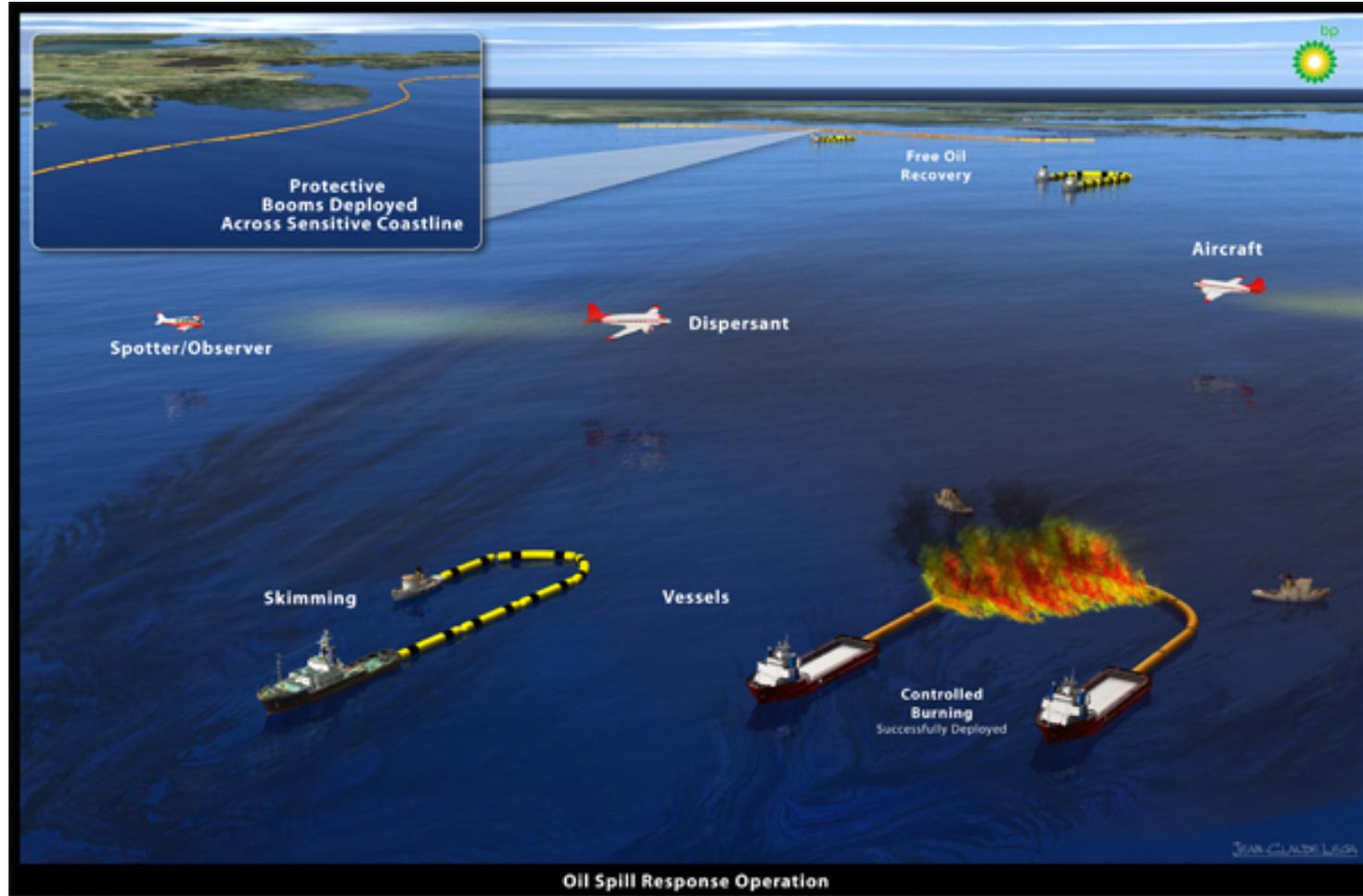
# Organogels



- **20+ years of research**
- **Transdermal drug delivery**
- **Cosmetics**
- **Oil Spill Clean Up**



# Oil spill clean-up



# Current Developments

A Journal of the Gesellschaft Deutscher Chemiker D 3461

## Angewandte Chemie

International Edition www.angewandte.org

GDCh 2010-49/42

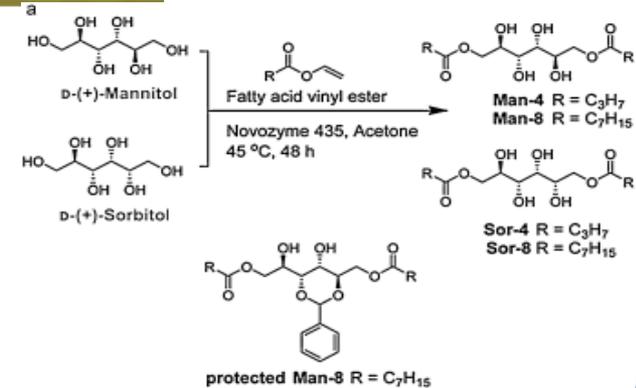
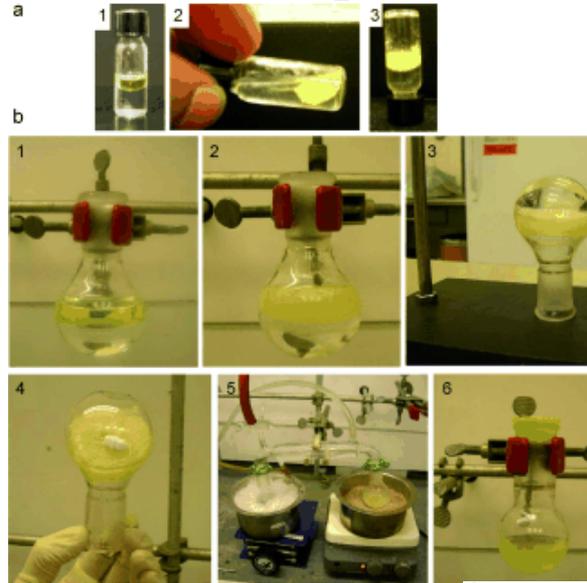
RECOVERED GELATOR RECOVERED OIL

Semiconductor Gas Sensors  
A. Tielki et al.

Highlights: Carbon Monoxide Detection · Carbon Nanotubes as Nanopores · Insulin Synthesis

ACIEFS 49 (42) 7597-7816 (2010) · ISSN 1433-7851 · Vol. 49 · No. 42

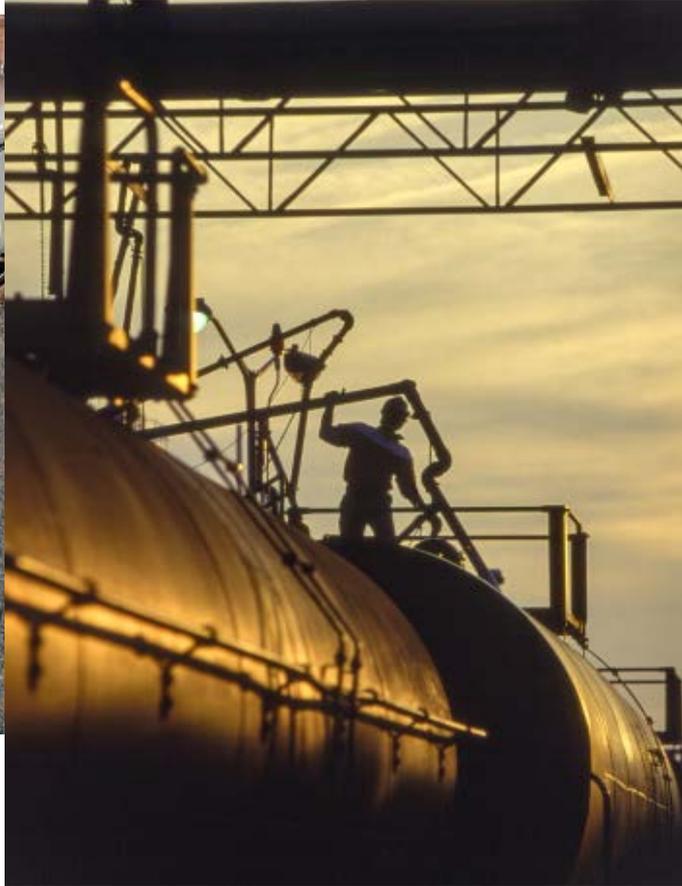
WILEY-VCH



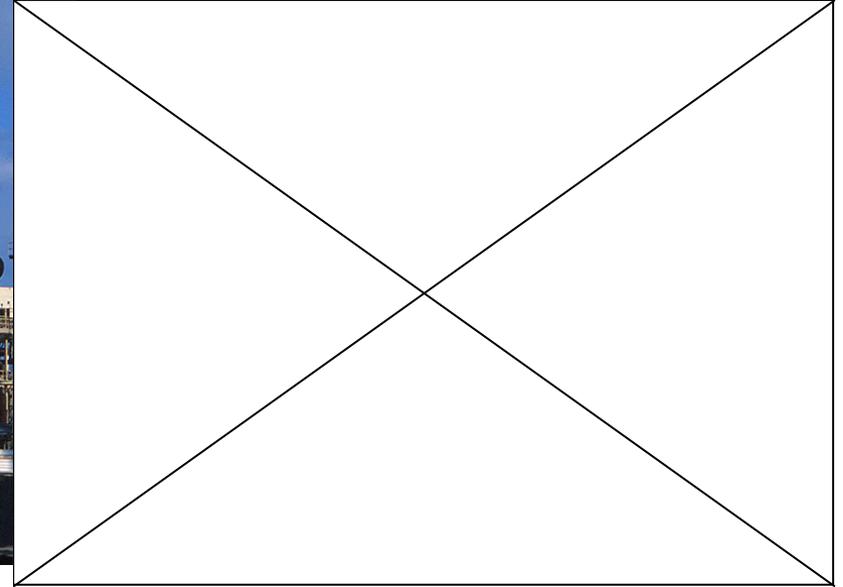
# Transportation Application



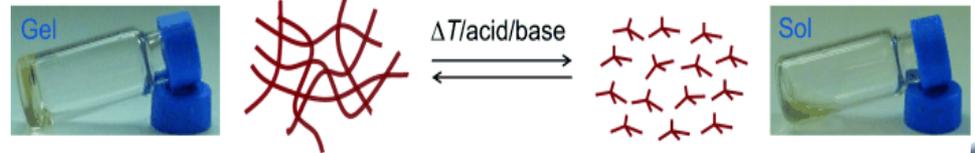
# Concept

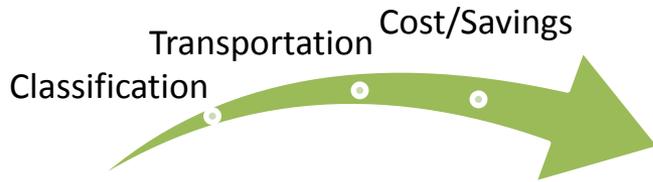


# Concept's Needs

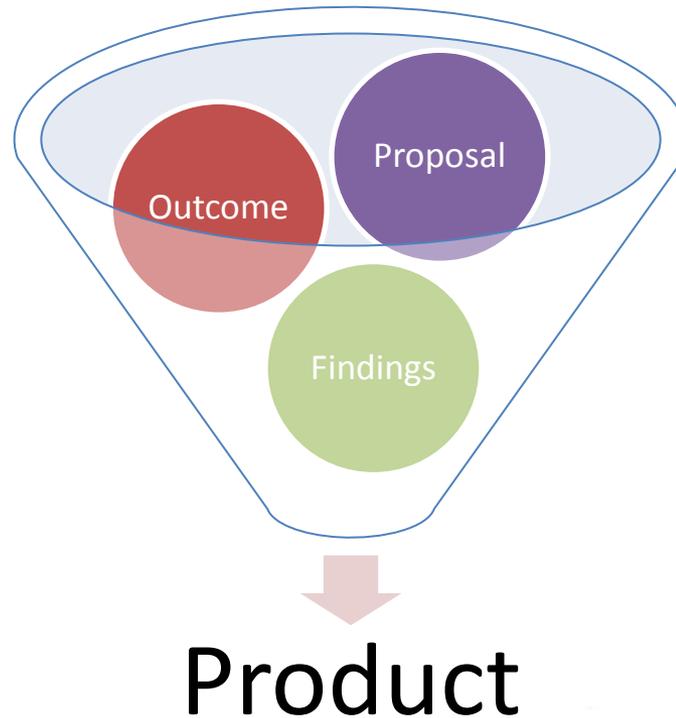
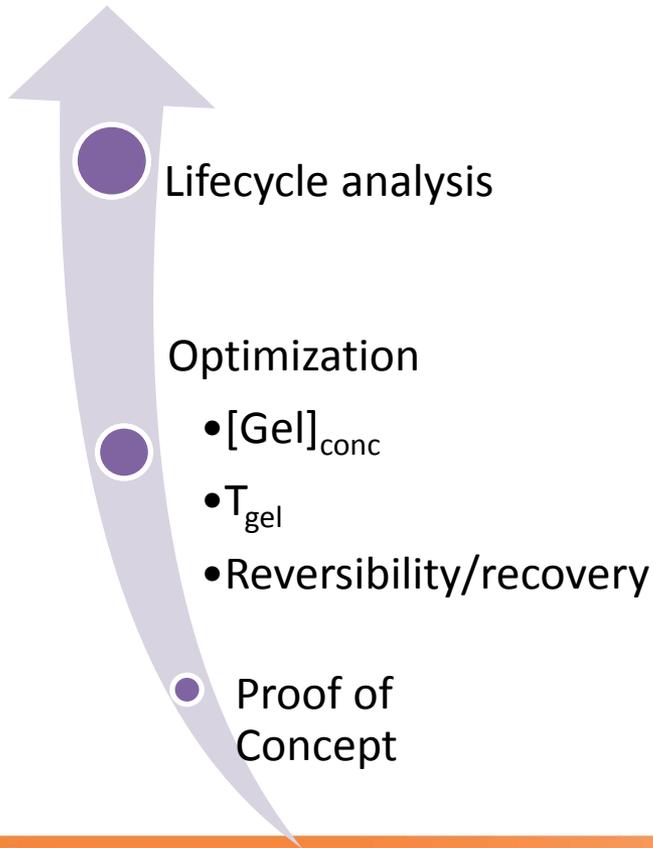


- **Thermoreversability**
- **Low effective [Gel] (0.1-0.2%)**
- **No detectible volume change**
- **High recovery**





- RFI/BAA
- 1 year, \$150,000



# References

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