



Working with Outside Users At UW-Madison

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Core Labs In the College Of Engineering



- Materials Science Center—Microscopy, Spectroscopy for Characterization of most materials- 400 users
- WCAM- Clean Room-150 users
- Soft Materials Laboratory: Polymer & Physical Properties Analysis (MRSEC and NSEC) (40 users)
 - We train about 120 users per year.
 - We have about 40 corporate users
- Plus a half dozen major labs for specialized work;
 - Reid Center for Photonics: MBE III-IV compounds
 - Polymer Engineering Center
 - Asphalt testing Center



Three Standard Use Agreements, and Consortium Collaborative Membership



- **Standard**

- **Core facilities:** Simple 2 page agreement: sign up for an account, schedule training, indemnify UW, you do the work, your IP.
- **Facilities use agreements:** 6 pages, defined project, commitment to facility hours, indemnify UW, liability and Workers Comp, negotiated rates, your IP.
- **Sponsored Research Agreements:** Contract with the University, engage PI and students, lab access. IP through WARF.

- ❖ **Consortium Collaborative Membership**

- ❖ Advanced Materials Industrial Consortium (UWAMIC)
- ❖ Available only to Consortium Members.
- ❖ IP status negotiated upfront in “enhanced Consortium agreement”.
- ❖ Designed so both parties see short term benefits: Product impact and return to the University researchers group



Collaborative Memberships



- Sigma Aldrich and UWAMIC developed the “collaborative member” initiative.
 - New materials are suggested by UW or SA researchers
 - Using a business “stage gate” evaluation new materials are developed based on market potential: Go/No Go points clearly defined.
 - ✓ If market assessment looks good, SA makes the material
 - Fast, Good, not Cheap (\$20K to \$30K)
 - ✓ UW researchers receive materials to evaluate, report to SA on performance. UW contributes applications experience
 - Final version is “productized”, SA supplies product to UW for researchers to use. (\$500 to \$1500 per gram)
 - ✓ Can the Product be manufactured with good Margins
 - SA markets the materials under an up front negotiated IP agreement with WARF

The first new materials from this collaboration appeared in the 2010 SA catalogue!

- **Four new projects were suggested in late 2010 - 2011!**
- **ONLY one passed all Gates**

✓ indicates a stage gate, not all gates are listed



First results of SA collaborative membership



Sigma Aldrich RAFT Product Table

As a result of this collaboration, Sigma-Aldrich supplied PI groups (Gopalan, Mahanthappa) with 5 grams of RAFT agents (2010)

One material from the Nealey group has been supplied. (2011)

Sigma Aldrich wants to grow the program with additional funding! (2012)

Name	Purity	Prod. No.
2-Cyano-2-propyl benzodithioate	>97%	722987
4-Cyano-4-(phenylcarbonothioylthio)pentanoic acid	98%	722995
2-Cyano-2-propyl dodecyl trithiocarbonate		723037
4-Cyano-4-[(dodecylsulfanylthiocarbonyl)sulfanyl]pentanoic acid	97%	723274
2-(Dodecylthiocarbonothioylthio)-2-methylpropionic acid	98%	723010

Four of nine RAFT initiators suggested by NSEC PI and Thrust 1 co-leader Gopalan. See catalog for structures.

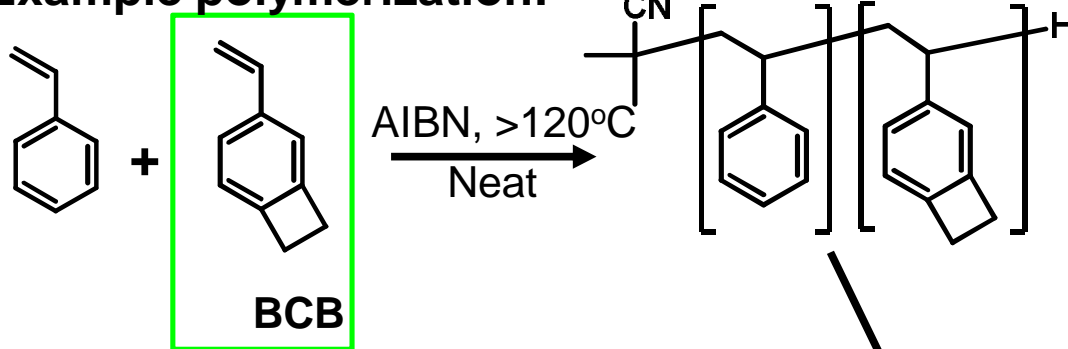


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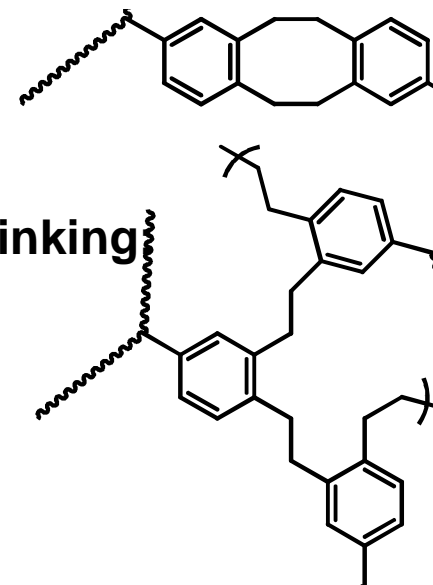
4-Vinylbenzocyclobutene Monomer (BCB)



Example polymerization:

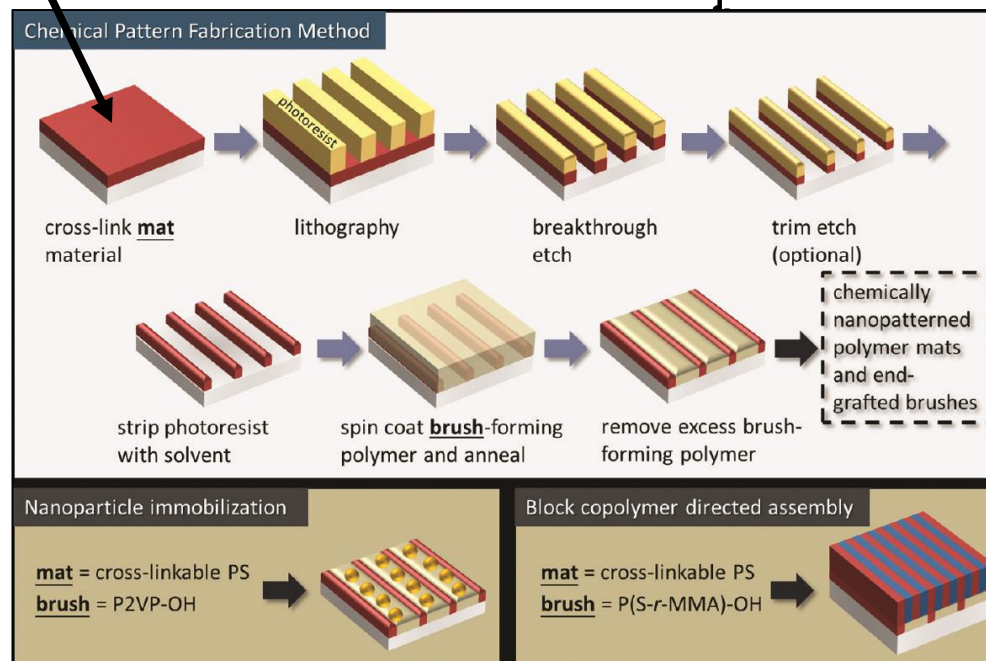


Crosslinking



Advantages of the BCB Monomer over the originally reported glycidyl methacrylate monomer:

- High temperature crosslinking (onset $\approx 160^\circ\text{C}$, rapid above 200°C)
- Copolymers have long term solution stability
- Crosslinking creates no volatile products





Collaborative Membership Summary



- **Benefits: a WIN - WIN**
 - Member gets “research tested Products)
 - Researchers get new materials faster (typically 2 to 3 months) than doing it in own lab
 - UW gets defined amount of “free material”
- **Next Steps: Accelerate the pipeline**
 - Sigma Aldrich will place two Industrial Fellows into a MRESC Lab
 - SA will provide Support for Fellows, one staff researcher and a graduate student.
- **Three more large Industrial firms are exploring Collaborative Memberships for 2012.**