Thermosets Lab (Day 1)

An activity on Thermosets

Chemical Bridges

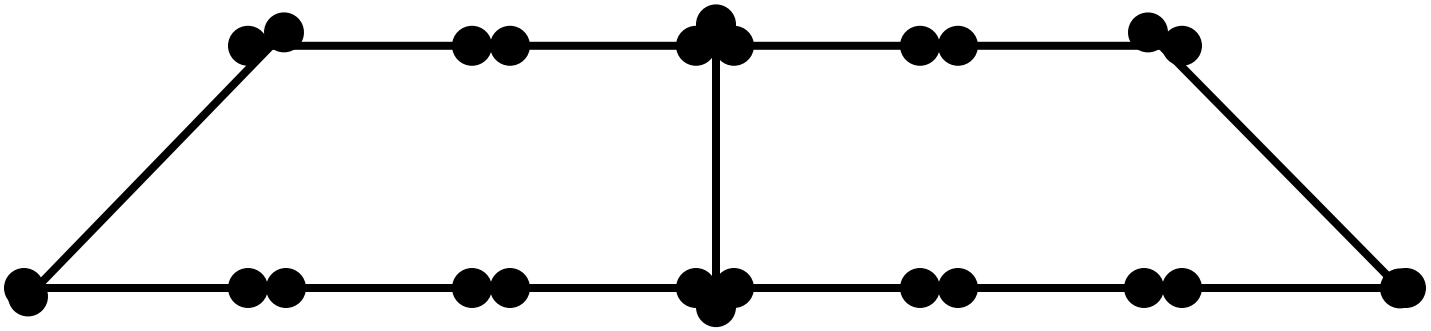
How would you make a flexible chemical bridge?

Many or few connections?

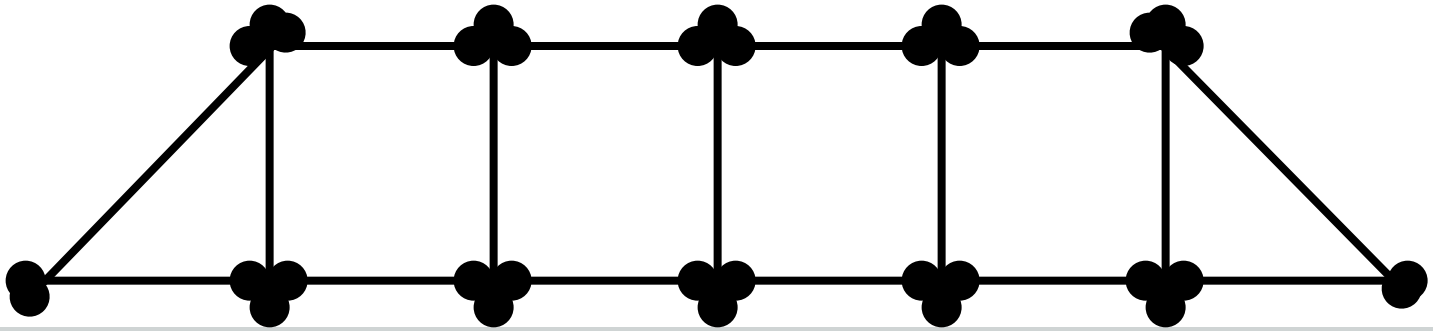
How would you make a strong chemical bridge?
Many or few connections?

Classical Bridge

Example of a weak bridge

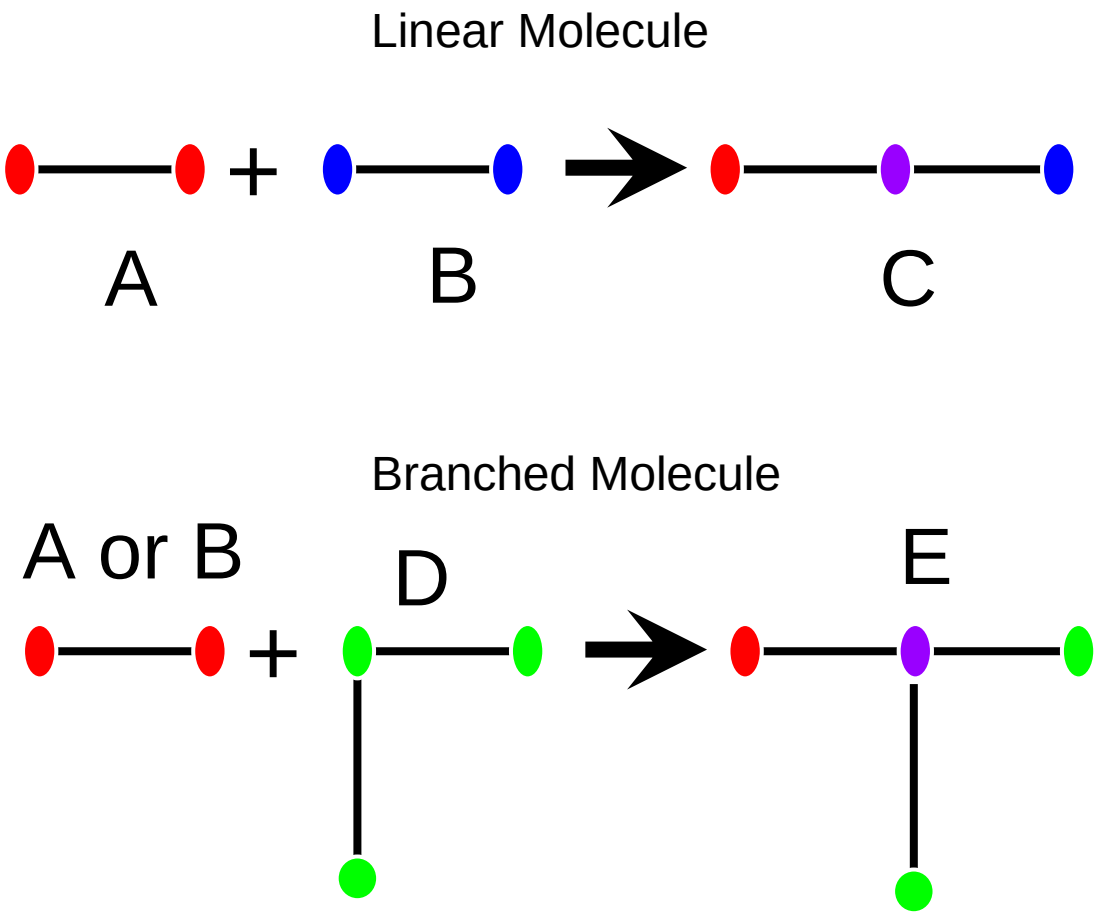


Example of a strong bridge



Chemical Bridges

By varying the ratio of molecules we can vary the number of connections

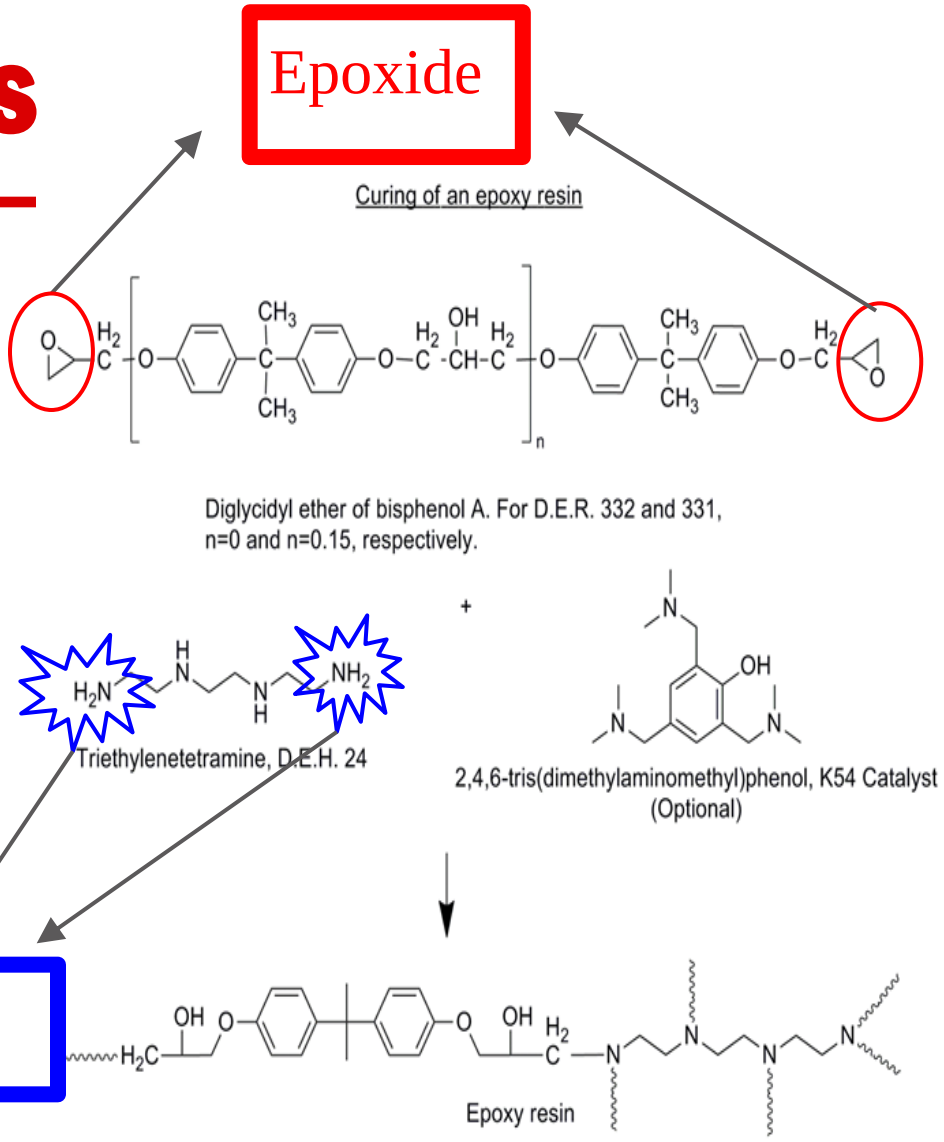


Chemical Bridges

Epoxy = Di-functional

Amine = Hexa-functional

We can manipulate the thermosets properties by varying the ratio of epoxy to amine



Thermosets - Lab

1. Students, now complete the Pre-Lab questions on your worksheets.
2. Students, now I will split you up into groups of 2 or 3.
3. I will assign each group letters A-D. Each group will do two mixtures. See the Ratios Data Table provided in the Thermoset Lab Worksheet for your assigned mixtures.
4. Mix the epoxy and hardener in the paper cup. DO NOT MIX THE TWO PLUNGERS AS THE MATERIAL WILL HARDEN PREMATURELY.
5. Put exactly 3 ml in the molds, and label the molds with a felt tip pen.
6. Place the mold on the proper shelf in the oven.

Breaking Molds Portion (Lab) Day 2

1. Remove your molds from the tin foil as best you can without destroying the mold itself. Testing the mold with some of the tinfoil on will not affect results greatly as the mold is much stronger than the aluminium foil.
2. Perform flexure test and record data in the Ratios Data Table provided in the Thermoset Lab Worksheet.
3. We will share the data with one another at the end of the lab activity on the board at the front of the classroom.
4. Now take an average of everyones data and record those in the remaining data mixtures done by your peers, and average your results.
5. Share results and record in your data tables.
6. Finally, complete the post lab analysis graph and questions.