

## Cross-Linking Alginate

Background: Polymers have the ability to cross-link. As we already know, polymers are long chains that can independently move through solution. A cross-linked polymer, however, has bonds connecting the different chains, restricting the independent movement of these chains. This can change a liquid polymer into a “gel”, with properties of a solid. Cross-linking is very useful: for example, in order to be used in hard car tires, the molecules that form rubber must be cross-linked. The “Gel Beads” demo uses a set of “alginate” polymers that have been extracted from kelp (brown seaweed). These alginates are very long polymers, which can crosslink via calcium ions. We will combine a drop of solution of these alginates with a solution of calcium chloride, and produce a solid!

Materials: (to be updated more fully)

-alginate powder

-water

-CaCl<sub>2</sub>

Procedure:

1. Mix alginate powder with water in a ziplock bag and squeeze until it forms a gel-like consistency.
2. Make a solution of CaCl<sub>2</sub> and water; pour solution in a small bowl.
3. Use the dropper to squeeze out the alginate solution into the calcium chloride solution. Watch what happens. Use the mesh grid to pull out the resulting beads and play with them.