College of Chemical, Biological, and Environmental Engineering

Use of Gellan Gum and MetaMix to Create Hydrogels for Burn Patients

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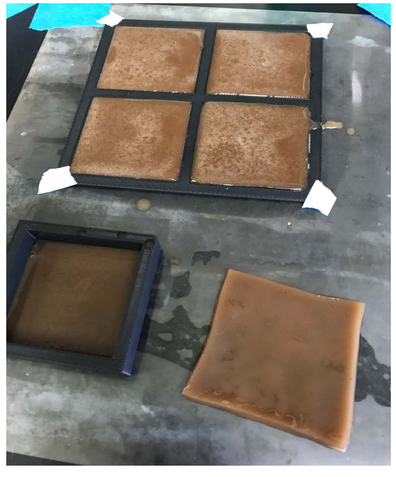
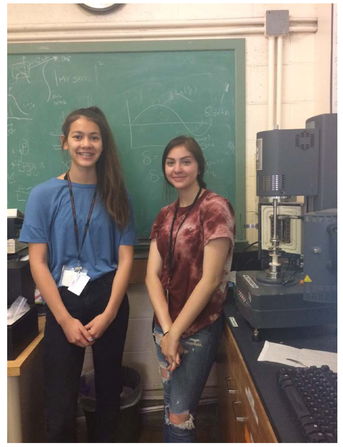
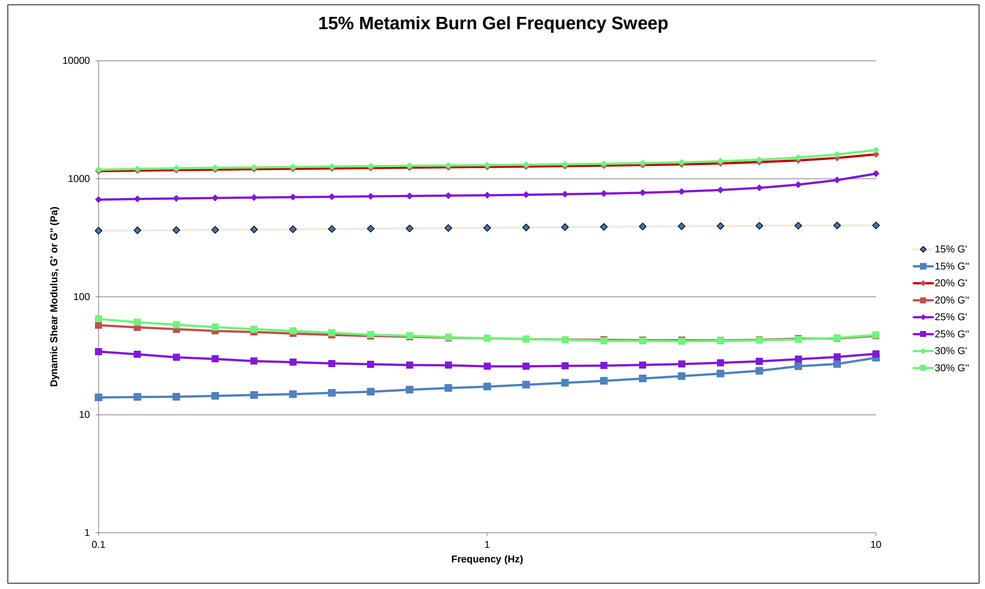
Application:
The purpose of our burn gel is to help the healing process of third degree burns and to help burn victims change their bandages less painfully. This gel is currently being tested on chefs who get minor burns from cooking on a daily basis.

Background: The MetaMix we used contains mint, botanical compounds, oils, and glycerin. This mixture is used for treating burns. First degree burns are the least serious, only burning the first layer of skin and causing swelling. Second degree burns are more serious, they burn the second layer of skin and can cause blisters. Third degree burns are the most serious, all the layers of skin are burned and can burn your fat and bones. These Hydrogels are meant for second and third degree burns.



Procedure:
1.Sterilize materials
2.Measure out Deionized water (D.I.) and gellan gum powder
3.Heat water and add the gellan powder slowly while mixing the MetaMix and glycerin together
4.Set up molds
5.At 80 degrees add MetaMix mixture to gellan gum powder slowly
5.Let the mixture sit until it raises to 83 degrees
6.Pour into molds





To create the graph above we used a rheometer to measure the visco-elastic properties of each of our gels. From the graph you can see each gel is more elastic than viscous based on the G' and G'' values.

Conclusion: For each batch of gels we used a different concentration of MetaMix (15, 20, 25, or 30%). We found that the 30% gel synerised (leaked MetaMix) when left at room temperature and in the fridge. The 25% gel however did not synerise. We also found that each gel we made didn't fall apart or disintegrate, they all stayed together with no tears and were fairly resilient. In the future we might try 26% or 27% MetaMix to avoid syneresis but still have the highest concentration of MetaMix that we can. We want to maximize concentration in order to relieve the most pain and help speed up the healing process following a serious burn.

Rachel, Madison, Molly

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