Bioplastic (agar-agar-based)

A vegan flexible, transparent foil that can resist water and moderate heat (up to 185 F) quite well without transforming. This foil feels rubbery and flexible, and can remain a little sticky. It's not as sticky as cling film or cellophane, it's more comparable to a transparent PVC foil.

RECIPE

Ingredients

1. Agar-agar - 7 gr
   Functions as the polymeer (makes it hard)
2. Glycerine - 10 gr
   Functions as plasticizer (makes it flexible).
3. Water - 200 ml/gr
   To dissolve and mix the polymer and plasticizer
   You can include your natural powder or liquid dye in this mixture to add color as part of the total amount.

Tools

- Cooker or stove (ideally temperature controlled)
- Pot
- Scale
- Spoon
- Mould of about 6”x6” (or equivalent).
  Optional: you can also cast on a surface like an acrylic sheet. Your sheet will be thinner and shiny.
  If you use a waterproof fabric as a surface, your sheet will be mat.

This recipe is a remix from:
http://149.210.144.77:8080/#/material/335
https://class.textile-academy.org/2020/loes.bogers/files/recipes/agarfoil/
https://www.instagram.com/tv/CMj3-MaKOG9/?utm_source=ig_web_copy_link

Method

1. **Preparation**
   - Weigh your ingredients
   - Prepare the casting surface and find a place where you can leave it for a while, ideally near an open window where there's air flow.
2. **Mixing and dissolving the ingredients**
   - bring the water to the boil
   - optional: substitute part of the water with natural dye if you wish to use color
   - add the glycerine
   - add the agar
   - bring the mixture to the boil while stirring gently, to dissolve the agar.
3. **Cooking the ingredients**
   - when the agar is dissolve completely, lower the temperature to 60-80 degrees (make sure it doesn't bubble), and let it simmer and evaporate water for 40 mins while stirring slowly and continuously.
   - the agar should have the consistency of a light syrup, you should be able to leave a "trace" with you trace your spoon across the pot.
   - If your mixture is thicker it will spread slowly resulting in a thicker foil, if it's more liquid, it will spread wider, resulting in a thinner foil.
4. **Casting**
   - Cast onto the surface
   - Pour from the middle and hold still, let the liquid distribute itself, it cures quickly if it is thick.

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Drying/curing/growth process

Allow the foil to dry for a week for best results (or 3 days minimum). If you don't peel it off the surface it will shrink much less in width/length.

- Mold depth: 1.5-2.5 mm
- Shrinkage thickness 40-60 %
- Shrinkage width/length 5-10% %

Shrinkage and deformation control

Agar foil shrinks quite a lot, especially in thickness. The amount depends on the amount of water that has been evaporated/cooking time.

Curing agents and release agents

None

Minimum wait time before releasing from mold

3 days

Post-processing

None, store dry and flat.

Further research needed on drying/curing/growth?

Not sure

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