

Standard Operating Procedure

Bio-Based Watercolor Paints

Laboratory: Bioresearch

Location: RM 123

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General: Bio-based watercolor paints are a sustainable alternative to traditional watercolor paints, utilizing renewable resources like corn, soy, honey, and glycerin to replace petroleum-based ingredients. They reduce environmental impact while maintaining the quality and performance expected of traditional watercolor paints. Gum arabic is a water-soluble gum which is extracted from the acacia tree, and it acts as the glue that binds the pigment. Glycerin, soybean oil and honey act as a humectant and a plasticizer meaning that they increase the flexibility of gum arabic (a naturally brittle binder) and prevent cracking of the paint in the pan after drying.

Safety: Safety Glasses and Gloves (optional)

Materials

50mL Beaker	Glycerin/Honey/Soybean Oil (7.5mL = 6g)
Plant Powders	Lemon Juice
Gum Arabic Powder	Baking Soda
Hot Plate	Disposable Pipettes
Stir Sticks	Paper plates or Aluminum Foil
Small Weigh Boats	Serological Pipet/Pump

Procedure

Prepare Watercolor Base Medium (One batch will make 8 sample colors)

1. Using a graduated cylinder, measure 23mL of water and pour into a 50ml beaker.
2. Place the beaker of water on a hot plate and bring to a boil.
3. Using an electronic balance, weigh out 6g of gum arabic powder and add it to the beaker of boiling water. Remove the beaker from heat to mix powder until completely dissolved.
4. Once binding powder is dissolved completely, use a serological pipette to add 7.5mL or use an electronic balance to weigh out 6g of the selected plasticizer to the beaker and mix thoroughly.

Prepare Watercolor Paint

1. Using an electronic balance, measure 0.5g of plant powder (colorant) and place it on a piece of aluminum foil or paper plate.
2. Make a small well in the middle of the plant powder and add 5 mL of the watercolor base medium into the well.
3. Using a spatula or stir stick, mix base and colorant to incorporate ingredients.
4. If the mixture is too gritty, add a few drops of base medium and mix until smooth.
5. Use the spatula/stick to scrape paint into a small paint cube.
6. Repeat steps 1-5 to create other colors.

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