

Questions to answer for "Isolation of Eugenol from Cloves" lab report

Name: _____

1. What is the purpose of a steam distillation? (*Why are we doing it, and how does it work?*)
2. What is the boiling point of eugenol?
(*Does that match the temperature on the distillate, and how does that relate to question #1?*)
3. Why do you think the distillate has a cloudy white appearance?
(*What is in the mixture you are collecting?*)
4. The combined organic layers are mixed with two portions of 5% aqueous NaOH. During this step, is the **eugenol** in the organic or aqueous layer? Draw the structure of eugenol and explain why it is in this layer.
5. The combined organic layers are mixed with two portions of 5% aqueous NaOH. During this step, is the **eugenol acetate** in the organic or aqueous layer? Draw the structure of eugenol acetate and explain why it is in this layer.
6. What is the purpose of neutralizing the aqueous layer? Use drawings to illustrate what is happening in this step.

7. Why do the combined aqueous layers turn cloudy/form precipitate as the acid is added?

8. The acidified aqueous layer is mixed with two portions of dichloromethane. During this step, which organic compounds are present (eugenol and/or eugenol acetate), and in which layer, organic or aqueous? Explain.

9. What is the purpose of a rotary evaporator (rotovap)? (*Why is it used and how does it work?*)

10. What are some uses for clove oil, which is predominantly eugenol?

11. In the given experiment, what was the percent recovery for eugenol? (show your work)

12. The "crude eugenol extracts" IR spectrum analyzed the dichloromethane extracts before treatment with aqueous NaOH. Is there any evidence of eugenol acetate in the IR spectrum? Explain.