



goo.gl/4X5Ws4

Follow the given instructions to explore the “**extracting three times with ether**” animation, and answer the questions below. After the animation pauses, please read the onscreen notes provided before clicking “**continue**.” You may click on any **blue text** to learn more. This animation represents some of the steps you are likely to take after quenching an organic reaction with water (perhaps aq. acid or aq. base), so the reaction mixture will be the aqueous phase in the separatory funnel. It is colored blue to make it visible, and the blue circles and blue dots represent solutes.

1) Sketch a separatory (“sep”) funnel and label the following parts:

ring stand
stopcock
stopper
stem
support ring

2) Please begin the animation with “**Click Here to Start Experiment**,” and click “**continue**” to proceed through **Steps 1 through 4**. Answer the questions below.

- Ether is the organic solvent used in the animation. In a laboratory setting, the name “ether” is short for “diethyl ether.” Provide a structure for diethyl ether:
- Which is the upper layer? (circle one) aqueous or organic
- Why is it necessary to mix the layers for at least 20-30 seconds?
- Why is it necessary to periodically vent the separatory funnel, and how is it done?

3) Read about **Step 5** and answer the questions below.

- After mixing, solutes will be _____ between aq. and org. layers. *starts with “P”*
- Salts prefer the _____ layer; organic solutes prefer the _____ layer.
- In your own words, describe what an **emulsion** is, and provide four possible solutions to the problem.
- Why are 2-3 extractions with ether usually performed? *hint: read more about **solubility***
- What does the term “salting out” mean, and how does it work?

4) Proceed to **Steps 6** and **7** and answer the questions below.

j) When draining the separatory funnel, should the stopper be: on or off ? (circle one)

k) True or False (circle one): *All* of the organic compound (blue open circles) moved to the organic layer after the first extraction.

l) The animation shows the organic layer being drained through the stopcock. Why is it a better practice to instead pour it out from the top of the separatory funnel?

m) True or False (circle one): It is more efficient to do two extractions with 10-mL portions of ether than a single extraction with a 20-mL portion of ether.

5) Click on "**Start 2nd extraction**" and watch the entire process before answering the question below.

n) What are the seven steps involved in the extraction procedure? *Try to recall steps on your own.*

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

6) Note that at this point, very little of the organic solute (blue open circles) remains in the aqueous layer. Click on "**start 3rd extraction**" to continue, and then "**complete extraction process.**" Click on the **wash, dry** and **remove ether** buttons to learn more before answering the questions below.

o) Which layer is involved in the washing and drying steps? aqueous or organic (circle one)

p) What is the difference between "washing" and "extracting" steps in an extraction procedure?

q) How could a washing step remove residual acid?

r) In your own words, describe the "dry" step(s) – what is the purpose and how is it done?

s) Name three commonly used solid drying agents.

t) After removing the solvent, what is likely to be done with the isolated reaction products?