Template – copy by hand into lab notebook

Name _____ Lab Partner _____

TA Name _____ Section Day _____ Time _____

Experiment 2 Worksheet – Column Chromatography

Each student submits this individually on Canvas after lab

Pre-Lab Requirements

1. **Dress for lab** – see safety rules – please arrive a few minutes early
2. **Lab Notebook:** copy templates below into designated notebook
   - **Purpose, scheme,** and **reagent table**
   - **Procedure Diagrams** – copy templates provided, follow instructions to complete diagrams

A. Experimental Purpose and Structures of Excedrin Components

B. Reagent Table

Name	Volume	Density	Mass	milli moles	Molecular Mass	Boiling or melting point	Hazards
Excedrin	-						
Ethyl acetate							
K_2HPO_4			**-**				
KOH			**-**				
HCl			**-**				
Aspirin	-						
Acetaminophen	-						
Caffeine	-						

Check out Slugs@home for pics & videos of the whole lab!

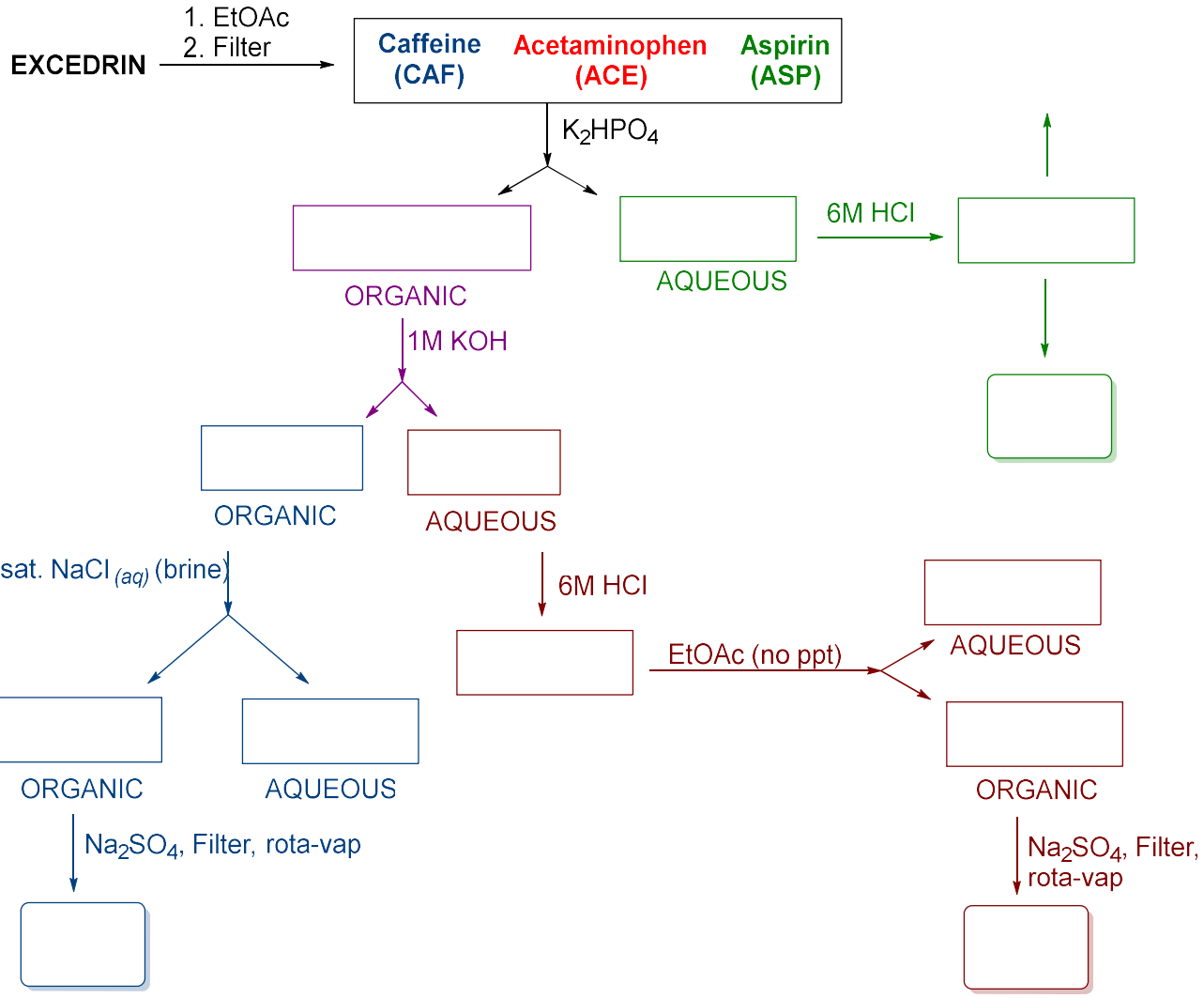
C. Procedure Diagrams of key procedural segments on provided templates below

- All **labeled equipment, chemical names** with **amounts**, and pertinent **safety notes** in every step.
- **Slugs@home Exp 2 website** - Equipment & Safety pages; pictures & videos of each part of the lab.
- The **class notes** include useful diagrams as well!

1. Active Ingredients in Excedrin

– crush, dissolve, & filter into separatory funnel

Fill in the boxes in this separation overview:



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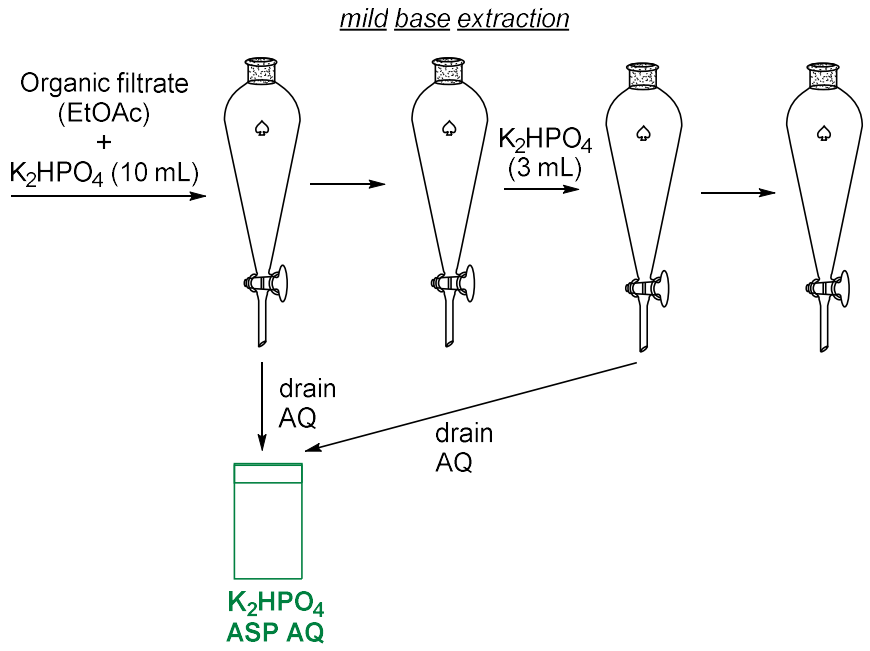
Template – copy by hand into lab notebook

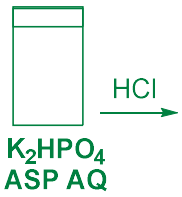
Indicate the layer(s) present in each separatory funnel diagram & label what components are in each layer

2a. Extraction with weak base

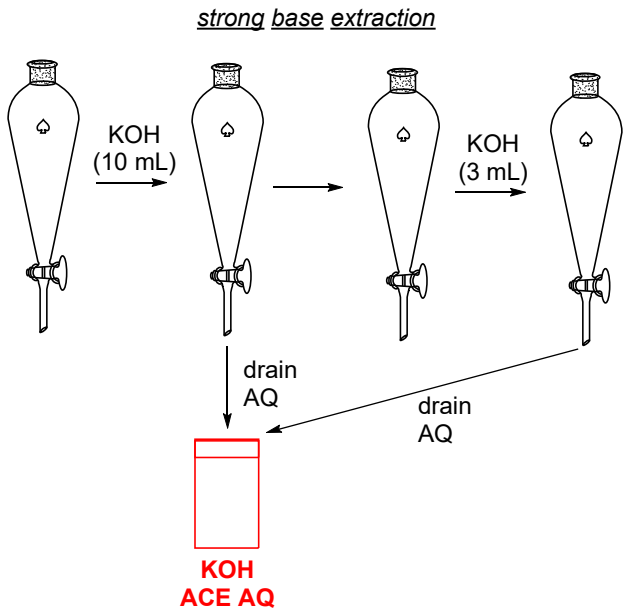


2d. Acidification & Isolation of Aspirin

* include pH testing and filtration



2b. Extraction with strong base



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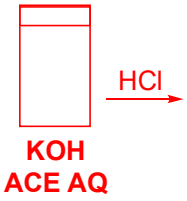
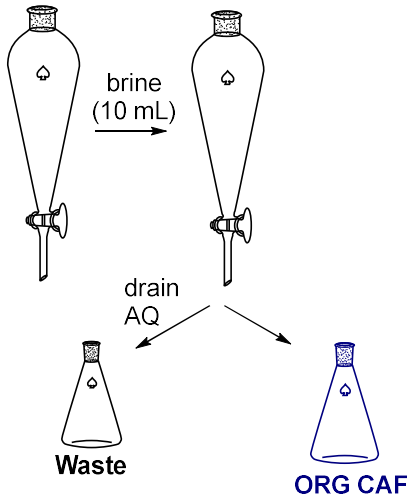
2e. Acidification of Acetaminophen

* include pH testing and filtration

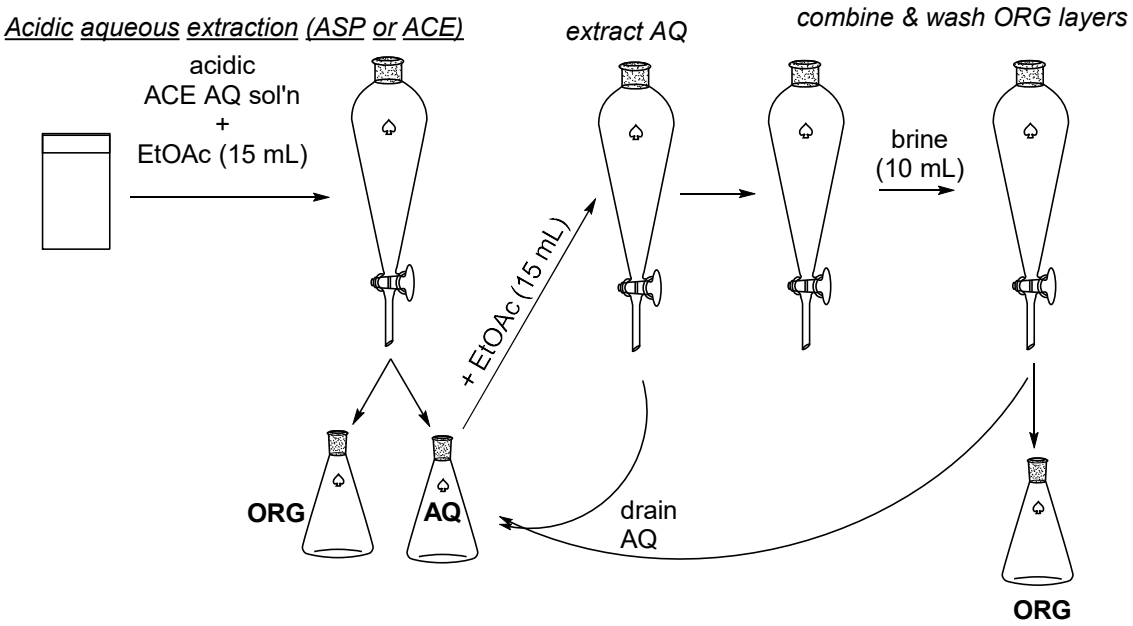


2c. Isolation of caffeine

* include steps to dry, filter, and concentrate CAF



2e. Acidic extraction and isolation of acetaminophen



* include steps to dry, filter, and concentrate ACE

Check out Slugs@home for pics & videos of the whole lab!

3. Analysis Procedure

(a) TLC – spot & run one plate; rough sketch of UV lamp and developed plates with labels

(b) IR – prepare and obtain the spectrum of one sample; rough sketch of IR spectrum

E. Data

Mass of Excedrin tablet _____ g

Sketches of TLC plates and calculated R_f values for each spot:

Standards
(pure ACE, ASP, & CAF)

Extracts

TLC results for Excedrin column separation (Retention Factor, R_f values)

	ASP standard	**ASP extract**	**ACE standard**	**ACE extract**	**CAF standard**	**CAF extract**
ASP						
ACE						
CAF						

Mass recoveries after concentration:

ASP _____ g ACE _____ g CAF _____g

Percent recoveries = (mass recovery) / (mass of tablet) x 100%

ASP _____ % ACE _____ % CAF _____%

Check out Slugs@home for pics & videos of the whole lab!

IR Analysis – see pre-lab questions for how to spectra from structure. Observe your IR spectrum and identify any signals within the expected range from the IR Tables. It is acceptable for a signal to be "not observed."

ASP

Functional Group	Bond	Expected Wavenumber Range (cm^{-1})	Observed Wavenumber (cm^{-1})

ACE

Functional Group	Bond	Expected Wavenumber Range (cm^{-1})	Observed Wavenumber (cm^{-1})

CAF

Functional Group	Bond	Expected Wavenumber Range (cm^{-1})	Observed Wavenumber (cm^{-1})