May 2020

LabChemistry_IS2_20160330_Camera1_Seg01.pdf

Participants: IS2 (ita, glasses, white lab coat), S1 (other ta, male, dark sweater and dark hair) S2 (other ta, female, black shirt with yellow letters), S3 (male student), S4 (female student), S5 (female student), S6 (male student)

Context: IS2 explains to the students how to do their experiment, and then walks around helping them with their lab.

0:00

xxx IS2: uh: expect all the (acid) uh-uh- all the (.) alcohol will
xxx transfer- will c- uh- will (.)
xxx uh change into the (answer)
xxx so it's a ((undecipherable)).
xxx so the-the way that we want to increase uh: the
xxx ((undecipherable)) uh yield is
xxx we can increase (.)
xxx one of the starting material.
xxx so in today's experiment,
xxx we have (.) the acid in excess than the alcohol.
xxx so basically after you finish experiment,
xxx so n- uh: (.)
xxx no doubt we have a-an ex- we have a- we-we still
xxx have a lot of acid in your m- reaction mixture.
xxx so dur- uh so after you finish experiment,
xxx the (.) thing you need to do is
xxx you need to uh: remove the (.) excess uh: it- uh: acid,
xxx with some you know way.
xxx so: basically,
xxx the way we-w-we need to do in this experiment is we add-
xxx after we finish this experiment,
xxx we add a base.
xxx because (.) uh: is this- uh- which is the sodium carbonate.
xxx and this base will react with the excess aci- uh:
xxx a-acid.
xxx will remove s- uh: th- uh: >how you say< this is uh: th- this
xxx a-acid.
xxx so basically you've got this reaction.
xxx and uh:
xxx this, (.1)
xxx and uh they will change the acid into a (.)
xxx ((undecipherable)) form.

xxx and this ((undecipherable)) form is water soluble.
xxx so when you do the (.) separation
xxx in the- in the- in the separation funnel,
xxx a:ll the- uh ((undecipherable)) will go- will go to the
xxx ((undecipherable)) layer.
xxx so,
xxx basically this is the whole thing of this experiment.
xxx so,
xxx this other important thing is you need to know how to use
xxx the separation-separation funnel to separate (.) uh:
xxx to- a- basically uh: you have the ((undecipherable)) layer.
xxx and also you have the uh: (organic layer).
xxx so y-you just- so-
xxx ((pause))
xxx basically uh: if you have something i-in one mixture,
xxx so you add (organically) inside-
xxx oh-uh-uh- organic solvent inside this,
xxx if- if the- if the product is very you know organics uh
xxx soluble,
xxx it will goes to- it- it will go to the (organic layer).
xxx and that's why you can separate (.)
xxx your thing you want okay?
xxx so uh:
xxx (.2)
xxx the-the-the-the- the general procedure is
xxx you have uh: (.1)
xxx it should be a flask oh.
xxx ((pause))
xxx uh- it's a- basically it's rbf.
xxx and you have the (acid) inside this,
xxx and you have alcohol inside this,
xxx and also you have some you know (.)
xxx (catalyst is-) which is-
xxx (okay) ((undecipherable, mumbling to himself))
xxx ((pause))
xxx so:,
xxx you have a acid,
xxx and then you have alcohol,
xxx and you ha- also you need to add some uh c-cataly-catalyst
xxx inside your rbf.
xxx and don't forget add the ((undecipherable)) inside your
rbf.
xxx okay?
xxx and uh
xxx so the (reflux) for today's reaction is one hour,

xxx so after one hour,
xxx you transfor- y-you-you transfer your uh mixture solution
xxx into uh: separate- uh separate- separator funnel,
3:00
xxx and uh:
xxx ((pause))
xxx uh you transfer into (.) this here.
xxx and the- and the- after you transfer the- uh- this m-
xxx reaction mixture,
xxx you add a (pitcher of) water inside your separator funnel.
xxx and uh basically what you need to do is,
xxx so:,
xxx after you add the: rea-reaction mixture,
xxx and also (.) you add (pitcher of) water inside your
xxx separator funnel,
xxx the next thing you need to do you just mix them.
xxx you shake with them.
xxx so basically you just- like this.
xxx (.1)
xxx and =the shake- maybe not quite uh hard- uh strongly.
xxx okay gently sh-shaking.
xxx a:nd
xxx don’t forget to vent because,
xxx af- during the sh- uh: sh- during the mix- uh m-mixing so
xxx they will produce some you know bubbles and uh some-
xxx so you need to vent. (.) okay?
xxx a:nd do it again. (.) and then vent.
xxx do it again and then vent.
xxx okay?
xxx (.2)
xxx and then you just put it into the- uh iron (clamp).
xxx i-i-i-i-iron ring.
xxx and uh
xxx don’t forget to open this.
xxx because if you don’t- i-if you don’t open- (.)
xxx open the stopper,
xxx so: the separation between these two layer is-is extremely
xxx slow.
xxx make sure this (sample) is open to the (.) air okay?
xxx take (all) this out.
xxx and just waiting until you see two layers.
xxx and then you need to prepare two uh: (.1)
xxx two flask.
xxx one flask is for the ((undecipherable)).
xxx and one (flask) is for (organic layer).

xxx but don’t discard any of them
xxx if- uh before you finish today’s experiment.
xxx because,
xxx if you are confused which layer y- uh which- uh which layer
xxx contains your product,
xxx just t- just save all of- a:ll- just save two layers.
xxx okay?
xxx in your- in your hood.
xxx please do the separate- (.) please uh make sure
xxx all the experiment y-y-you do today-
xxx you do today is uh: (.1) (operate in your) funnel.
xxx don’t do it in your- in your- in your- in-in (under) your
xxx hood okay?
xxx so uh
xxx after you’ve got two layers,
xxx (.2)
xxx so:.
xxx (.3)
xxx this is organic layer.
xxx this is ((undecipherable)) layer.
xxx (.1)
xxx so uh,
xxx (.2)
xxx uh I can say- uh- is- this is organic soluble.
xxx it should goes to the organic layer.
xxx okay?
xxx but uh the thing y-you need to remember that
xxx in the organic layer,
xxx you have this,
xxx also you have an excess of the (acid) right?
xxx also you have a little bit this,
xxx so the next thing you need to do is
xxx you need to separate (.) this. (.) and this.
xxx how-how to separate this?
xxx so (.) after you’ve got (the) organic layer-
xxx so as I mentioned before you add uh:
xxx this base.
xxx (.2)
xxx so which is the s- uh sodium carbonate in this experiment.
xxx so,
xxx (.1)
xxx this is a reaction between the base and the- the acid in-
in
xxx your organic layer.
xxx so after the reaction,

xxx it will form a: ((undecipherable)) form.
xxx and then,
xxx you transfer all the s- this reaction solution
xxx in your funnel to- again.
xxx so this is the:
6:01
xxx second time do the separation.
xxx okay?
xxx after you add this mixture,
xxx you add the water inside uh:
xxx ish- because- the (face)- this is a solution.
xxx okay?
xxx this is a solution.
xxx and this is the organic layer.
xxx after you mix them (.) so
xxx (.1)
xxx you put- you put all mixture in your (separate funnel)
xxx it-it should have two layers.
xxx and do the separation again. okay?
xxx and the s- this step is- the reason why we do (this step) is
xxx you want to remove the (.) acid-uh we want to remove the (.)
xxx acid.
xxx and we want to
xxx uh:
xxx the acid- go to the ((undecipherable)) layer okay?
xxx so then- so by doing the separation again,
xxx we can separate the acid from your uh: ((undecipherable)).
xxx so:,
xxx then you've got two layers too.
xxx and (.) again y-y-y-you uh: don't discard any of them.
xxx so.
xxx (.3)
xxx and then,
xxx you-you still have two layers.
xxx and one- one is for the new organic layer.
xxx and one is for the ((undecipherable)) layer.
xxx okay?
xxx so,
xxx for this step ,
xxx according to the manual,
xxx you need to do at least two times
xxx until you check (with the) ((undecipherable)) layer.
xxx it is basic.

xxx if it is basic, that means
xxx you got- you- you- uh you are uh-
xxx so if- until you've got uh the ((undecipherable)) is basic.
xxx so which means,
xxx you uh: (can-) uh: almost all the acid will be removed.
xxx by the separation.
xxx okay?
xxx check the ph for the ((undecipherable)) layer.
xxx so:,
xxx (.3)
xxx if it is basic then,
xxx you have the organic layer,
xxx and uh you transfer into a:
xxx uh: a roun-round bottom flask- a round bottom uh flask,
xxx and do the r- uh:
xxx (.2)
xxx because (.) you do the separation,
xxx still- uh: still you have some uh wa-water inside the or-
xxx inside the organic layer.
xxx so the next thing we need to do,
xxx we-we add dry agent inside your- ah-ah- inside-inside
xxx the-the organic flask.
xxx to remove the- a little bit uh water inside the organic
xxx layer.
xxx so just uh- which- which is the
xxx sodium sulfate.
xxx so this is a dry agent
xxx to remove the little bit water inside organic layer.
xxx and after that you transfer the organic layer and-
xxx and you need to do the filtration.
xxx to filter the: dry agent.
xxx then you transfer the: s- the a- organic solution into
xxx your rbf.
xxx and do the ((undecipherable)).
xxx and remove the aci- uh remove the (ether).
xxx so which is solvent- which is a solvent okay?
xxx so,
xxx so yeah we have (ether),
xxx and we have (ester).
xxx (.1)
xxx ether is (.) the solvent and ester is your product.
INR because the boiling point for these two are very slow-.
INR a-a-are very low sorry.
xxx so when you do the ((undecipherable)),
xxx don't ((undecipherable)) for too long.

xxx because,
xxx when you ((undecipherable)) the ether,
xxx some of your (.) product will go (.) out (.) too.
xxx so,
xxx do the ((undecipherable)) not too- not for too long times.
xxx because next time,
xxx uh:
xxx you- you still need to do some ac-i-uh:
9:01
xxx you need- you still need to uh do the ((undecipherable)) to
xxx get more pure ester.
xxx so: we don't need to d- uh:
xxx evaporate uh all of your solvent.
xxx which is ether okay?
xxx just do a little bit.
xxx so if you don't have time to do the s- uh:
xxx ((undecipherable)) (.) you just save uh:
xxx the organic layer in your (.) uh drawer,
xxx and next time (.) you come here (.)
xxx and you can do the uh ((undecipherable)) again okay?
xxx so:.
xxx (.1)
xxx °anything else?
xxx S1: yeah can I- can I just clarify a few things?
xxx (the top of your) [((undecipherable))
xxx IS2: [yeah yeah yeah sure.
xxx S1: alright
xxx okay so,
xxx you're gonna want to ((undecipherable)) anyway
xxx it should be (colored brown),
xxx but I think it'll be on the top,
xxx S2: not too brown.
xxx S1: not too brown.
xxx (there should be a color to it) you'll be able to tell.
xxx u:m
xxx I want to mention a few things.
xxx when you're doing the extractions,
xxx right?
xxx the first- uh:
xxx the first few extractions it's okay if you (leave a little
xxx bit of the ((undecipherable)) layer,
xxx right?
xxx that's fine that's what you should do probably like a few
xxx drops,
xxx the last extraction,

xxx you want no ((undecipherable)).
xxx so,
xxx it's a good idea to sacrifice like one or two drops of your
xxx organic layer,
xxx so that you make sure that you don't have any
xxx ((undecipherable)) in your (.) um
xxx in your ((undecipherable)).
xxx so,
xxx the last extraction no ((undecipherable)) in there.
xxx sacrifice ((undecipherable)).
xxx um
xxx yeah and only ((undecipherable)) if you have time.
xxx you should- you should but you know that's okay.
xxx and uh: don't ((undecipherable)) for too long.
xxx ((undecipherable))
xxx so yeah I think that's about it you have your uh
xxx ((undecipherable)),
xxx and your (tlc report forms),
xxx u:m
xxx that's about it.
xxx IS2: yep.
xxx S2: [(yes)
xxx IS2: [and also uh: ((clears throat))
xxx so you need to calculate the alcohol
xxx and the ((undecipherable)) you use uh depending o:n
xxx the ((undecipherable)).
xxx because every-every person here is not- is- is (synthesize)
xxx different ester.
xxx so after you s- uh: your calculation,
xxx please check with me.
xxx and I will check the: calculation
xxx whether it is right or not.
xxx before you go on (.) to the experiment okay?
xxx so the- the acid is in the hood.
xxx so which in- which is in the ((undecipherable)).
xxx but for the alcohol,
xxx so after your calculation is right and uh
xxx just go to the stockroom and get the alcohol you want.
xxx for your s-((undecipherable)) answer.
xxx [okay?
xxx S1: [Ithink they said if y- did they say anything about if you
xxx have too much alcohol (you just pour it all)?
xxx S2: hm:
xxx S1: they said that right?
xxx yeah

xxx so for your- they said that
xxx IS2: okay.
xxx S1: (for you) when you get that from the stockroom,
xxx if you have too much alcohol just use it all .
xxx just make sure you write down how much (is added).
xxx I think as long as that’s what they said.
xxx S2: yeah because your-
xxx your alcohol is [((undecipherable)) your-
xxx S1: [yeah exactly.
xxx IS2: a-also one thing is
xxx you need to prepare a very clean vial.
xxx for the- fo:r next week experiment okay?
xxx so [(that should-)
xxx S1: [so clean it today and leave it out.
xxx IS2: just leave it dry and uh
xxx wash with uh water and then wash with acetone and uh
xxx just put it into a drawer let it dry.
xxx okay?
xxx S3: ((undecipherable))
xxx IS2: a:nd uh
xxx s:
xxx I think it’s (.) enough.
12:00
xxx okay?
xxx S1: (should they check with us)
xxx for the: ((undecipherable))
xxx IS2: so do the calculation first,
xxx and check with me.
12:08
xxx ((pause))
13:03
xxx S4: hello.
xxx IS2: hello.
xxx S4: I just wanna make sure that I'm (.) using the right acid.
xxx (.1)
xxx ah- this one.
xxx (.3)
xxx IS2: so: which acid do you choose?
xxx ((pause))
xxx yes.
xxx and two ((undecipherable)) yeah it’s good.
xxx S4: okay [thank you.
xxx IS2: [so:.=
xxx S4: =that’s all.
13:22

xxx ((pause))
13:55
xxx S5: so:,
xxx IS2: yeah?
xxx S5: my (calculations and then-)
xxx IS2: okay.
xxx which acid?
xxx S5: so I- I'm using ((undecipherable)) acid?
xxx IS2: so what’s the amount [for you?
xxx S5: [seven <(point five)>?
xxx IS2: yeah it’s right.
xxx S5: okay.
xxx IS2: and for the: alcohol?
xxx S5: alcohol? okay.
xxx IS2: okay.
xxx S5: I thought we just use what’s in the vial.
xxx IS2: yeah so this is the alcohol you used today, so
xxx just give me an amount.
xxx S5: oh okay [uh:
xxx IS2: [yes
xxx S5: four point six?
xxx (.2)
xxx IS2: uh:,
xxx (.2)
xxx two methyl (propane) right?
xxx S5: uh: it’s-
xxx IS2: °lemme see.
xxx S5: yeah [two ((undecipherable))
xxx IS2: [yes it’s
xxx (uh huh) okay yeah it’s right.
xxx S5: okay.
xxx IS2: yep.
xxx S5: thank you:
xxx IS2: yep.
14:32
xxx ((pause))
14:44
xxx S1: (uh hey)?
xxx ((undecipherable))?
xxx IS2: uh: liquid waste.
xxx S1: ((undecipherable))
xxx S2: water and-?
xxx IS2: water and uh:
xxx (e a) uh ((undecipherable)).
14:56

xxx ((pause))
15:10
xxx S6: did I do the calculations right for how much I need?
xxx S2: u:m,
xxx S6: six grams of ((undecipherable)) acid that's one mole-
xxx point one mole of the-
xxx (.2)
xxx of the uh:
xxx ((undecipherable)) [acid.
xxx IS2: [so:,
xxx S6: and then. (.) uh (.) point oh five moles [of
xxx S2: [yeah.
xxx S6: the um-
xxx S2: yeah that seems right.
xxx but you have to get the ((undecipherable)) acid in
xxx milliliters cause it's a liquid,
xxx S6: oh.
xxx S2: [yeah ((undecipherable))
xxx IS2: [so (.) both the acid and alcohol are liquid.
xxx S2: [((undecipherable)) yeah
xxx IS2: [((undecipherable))
xxx S6: oh no I didn't do the- the calculation.
xxx S2: yeah.
xxx S6: alright.
xxx IS2: you have the density in your manual.
xxx S6: yeah.
xxx IS2: [(just change this).
xxx S2: [(yeah just change the density) uh huh.
xxx (.2)
xxx (so then) he was right with the grams.
xxx cause it gives you grams right?
xxx IS2: do you have this?
xxx S2: yeah yeah I have it I have it.
xxx IS2: yeah I have several of them.
xxx S2: [((undecipherable)) ((laughing))
xxx IS2: [(one for you:),
xxx because this is from last semester.
xxx S2: oh yeah I remember them [though so
xxx IS2: [I got a lot.
xxx [what-
xxx S2: [yeah he got this right.
xxx IS2: yeah.
xxx this is-
xxx S2: yeah.
xxx IS2: the gram is right.

xxx (.4)