May 2020

LabChemistry_IS2_20160330_Camera2_Seg01.pdf

Setting: chemistry lab. Part of this is IS2 explaining the lab to the class
Participants: IS2 (male, blue/green/red shoes), S1 (male voice, not visible), S2 (male voice, not visible), S3 (male voice, not visible), S4 (female voice, not visible), S5 (female voice, not visible), S6 (male voice, not visible), S7 (unsure, sounds like female TA), S8 (male voice, not visible), S9 (male voice, not visible),S10 (female voice, not visible), S11 (male slightly taller than IS2), S12 (female voice, not visible), S13 (male voice, not visible), S14 (male voice, not visible), S18 (male voice, not visible), S19 (female voice, not visible), S20 (male, perhaps undergraduate TA), S21 (female, perhaps undergraduate TA), S22 (female voice, not visible)

1:24
Xxx IS2: guys come here
1:38
Xxx who has a pen.
Xxx S1: right here
Xxx IS2: ok thank you.
Xxx S1: ((unclear))
Xxx IS2: ok if you have ((unclear))
Xxx so uh
Xxx so today's experiment is about the uh-
Xxx (ester synthesis).
Xxx so basically if you uh-
Xxx know,
Xxx so
Xxx (ester) is uh-
Xxx synthesized
Xxx from the:
Xxx a- a acid
Xxx and uh alcohol right?
Xxx so uh:
Xxx this is the general equation for the-
Xxx for the (ester synthesis).
Xxx and you got (a ester).
Xxx so ((writes something))
Xxx because this is equilibrium.

Xxx you you you cannot get all-
Xxx you cannot uh expect all the acid.
Xxx all the-
Xxx alcohol-
Xxx will transfer-
Xxx will-
Xxx will uh-
Xxx change into the ((aster)).
Xxx so it’s (equilibrium)
Xxx so-
Xxx the way that we want to increase uh-
Xxx the (aster)) yield is-
Xxx we can increase one of the starting material.
Xxx so in today’s experiment.
Xxx we ((unclear)) the acid in ((unclear)).
Xxx then the alcohol.
Xxx so basically after you finish the experiment.
Xxx so-
Xxx uh:-
Xxx no that we have uh-
Xxx a- a we have uh-
Xxx we still have a lot of acid
Xxx in the reaction mixture.
Xxx so do a uh-
Xxx so after you finish the experiment.
Xxx the-
Xxx thing you need to do is-
Xxx you need to remove the excess-
Xxx uh- uh acid.
Xxx with some you know way.
Xxx so basically the way we- we need to do,
Xxx in this experiment.
TTF we ah after we finish this experiment.
TTF we add a base.
TTF because uh-
TTF is this is-
TTF which is the sodium carbonate.
TTF and this thing ((unclear))
TTF uh acid-
TTF uh uh how do you say-
TTF this- this acid-

TTF so basically you got this reaction.
TTF and the-
TTF this-
TTF and then they will change the acid into uh- (ionic
TTF form).
Xxx and this (ionic form)
Xxx is water soluble.
Xxx you do the-
xxx separation.
Xxx in a in a separatory funnel.
Xxx the uh (ionic form) we are go-
Xxx we are go to the ((unclear: akreus)) layer.
Xxx so it- this is the whole thing of this experiment.
Xxx so-
Xxx the other important thing is you need
Xxx to how to use the separate
Xxx separation funnel.
Xxx to separate a-
Xxx to ((audio gone))
Xxx ((unclear: A)) layer.
Xxx and also you have the uh-
Xxx organic layer.
Xxx so you you just
Xxx so ((no audio))-
Xxx basically uh if you have something i- in one mixture.
Xxx so you add organic layer inside-
Xxx organic solvent inside this.
Xxx if the if the ((muffled sound))
Xxx organic soluble.
Xxx it will go to the organic layer.
Xxx and that's why you can separate the thing you want.
xxx ok?
Xxx so uh (.)
Xxx the the the general procedure is
Xxx you have uh-
Xxx there should be a flask or-
Xxx ((pause))
Xxx uh is uh basically ((unclear)).
Xxx and you have the (ester inside this).
Xxx and you have (alcohol inside this).
Xxx ((4:50-5:03 inaudible))

5:08
Xxx so
Xxx acid and then you have ((unclear)).
Xxx also you need to add some uh-
Xxx cata- catalyst.
xxx inside your (rbf).
Xxx and don’t forget add the boiling (stone) inside your
Xxx (RFB).
xxx ok?
Xxx and uh so the ((unclear)) for today is one hour.
Xxx so after one hour.
Xxx you transfer-
Xxx you- you transfer your uh mixture solution-
Xxx into uh-
Xxx separ uh- separ uh-
Xxx separatory funnel.
Xxx and uh-
Xxx (.3)
Xxx and just to this here.
Xxx and uh and uh-
Xxx after transfer this ((unclear)).
Xxx you add uh ((unclear)) water inside the
Xxx separatory funnel.
Xxx and uh basically what you need to do is-
Xxx so-
Xxx after you add the-
Xxx reaction reaction mixture.
Xxx ((5:55-5:59 no audio))
6:00
Xxx asking you to
Xxx you just mix them.
Xxx you shake with them.
Xxx so
Xxx basically you just-
Xxx (like this),
Xxx and the shake maybe not quite
Xxx uh hard-
Xxx uh strongly.
Xxx very gently.
Xxx shake shaking.
Xxx and don’t forget to vent-

Xxx because af-
Xxx during the uh-
Xxx during the uh mix mixing.
Xxx so-
Xxx there will produce some you know bubble-
Xxx and some-
Xxx so you need to vent.
xxx ok?
Xxx and do it again.
Xxx and then vent
Xxx do it again and then vent.
Xxx ok?
INR and then you just put into the
INR (i- i- iron) clam.
INR (i- i- iron) ring.
Xxx and uh-
Xxx don’t forget to open ((unclear)).
Xxx because if you don’t-
Xxx you don’t open-
Xxx open the stopper.
Xxx so the separation between these two layer-
Xxx is extremely slow.
Xxx make sure the sample is open to the (.) air.
Xxx ok?
Xxx take the lid out and just waiting.
Xxx until you see two layers.
Xxx and you need to prepare two uh-
Xxx two flask.
Xxx one flask is for the ((akrius)) layer.
Xxx and one flask is for the organic layer.
Xxx don’t discard any them.
Xxx before you finish the (today’s) experiment.
Xxx because if you are confused
Xxx which layer you-
Xxx uh which uh-
Xxx which layer you contains your product.
INR just (save)-
INR just (save)-
INR just (save) two layers ok.
Xxx i- in your hood.
Xxx please do the separate-

Xxx please make sure all like experiment
Xxx yo you did today.
Xxx you do today is uh-
Xxx all in your funnel.
Xxx don’t do it in your in your other area hood ok?
Xxx so uh-
Xxx after you got two layers.
Xxx uh (.)
Xxx this is organic layer.
xxx this is ((akrius)) layer.
Xxx so uh
Xxx I can say is is this is organic soluble.
Xxx it should goes to organic layer.
Xxx ok?
xxx but uh-
Xxx the thing you need to remember that-
Xxx in the organic layer-
Xxx you have this,
Xxx also you have the excess of the ((ester)).
Xxx right?
Xxx you also have a little bit this,
Xxx so the next thing you need to do is-
Xxx you need to separate this,
xxx and this.
xxx how (to you) separate this?
Xxx so
xxx after you got the organic layer
Xxx ((audio prob))
Xxx mention before,
xxx you add uh
xxx (this).
8:10
Xxx ((audio prob))
Xxx so which is the ((unclear))
Xxx in this experiment.
Xxx so (.)
Xxx this is the base ((audio))
Xxx acid in in the organic layer.
Xxx so ((audio))
xxx (form an ionic form).
8:27

Xxx and then,
Xxx ((unclear)) solution.
Xxx (in your funnel) to
xxx again.
Xxx so this is uh-
Xxx second time separation.
xxx ok?
Xxx after you add this mixture.
Xxx add the water inside uh-
Xxx you sh- because the base,
Xxx this is a solution ok?
Xxx this is solution.
Xxx and this is organic layer.
Xxx after you mix them.
Xxx so you put-
Xxx so put all the mixture in separate funnel.
Xxx it should two layers.
Xxx and do the separation again.
xxx ok?
Xxx and this this step is
Xxx and >the reason why we want to do this step< is
because
Xxx we want to move the acid.
Xxx we want to remove the acid.
Xxx and we want to uh-
Xxx the acid go the ((akrius)) layer.
xxx ok?
Xxx so then-
Xxx so by doing the separation again,
Xxx we can separate the acid.
Xxx from your uh-
Xxx ((ester)).
Xxx so-
Xxx then you got two layers too.
Xxx and again you- you- you u:h-
Xxx don’t discard any of them.
Xxx so:-
Xxx and then you- you still have two layers.
Xxx and one- one is for the new organic layer.
Xxx and one is for the((arkius layer)).
xxx ok?

Xxx for for this step.
Xxx according to the manual.
xxx you need to do at least two times.
Xxx until you check the ((akrius)) layer.
Xxx it is basic.
Xxx if it is basic.
INR that means you got- you- you uh- you are uh-
INR so if-
INR until you got ((akrius)) is basic.
INR so which means-
INR you uh:- comple uh:-
INR almost all the acid will be removed by the separation.
Xxx ok?
Xxx check the Ph for the ((akrius layer)).
Xxx so (.2) if it is basic then,
Xxx you have the organic layer,
Xxx and uh transfer into a-
Xxx uh-
Xxx a round bottom a- flask-
Xxx a round bottom flask.
Xxx and do the uh ((no audio)))
Xxx you do the separation.
Xxx still
xxx still uh- you have some uh-
Xxx wa- water inside your inside the organic layer.
Xxx so the next thing we need to do-
Xxx we- we add a drying agent.
Xxx inside- in- inside the organic flask.
Xxx to remove uh a little bit water inside the organic
xxx layer.
Xxx so just-
Xxx whi- which is the uh-
Xxx sodium sulfate.
Xxx this is the drying agent.
Xxx to remove the-
Xxx a little bit water inside organic layer.
Xxx and after that you transfer the organic layer,
Xxx and and you need to do the filtration.
Xxx to filter the drying agent.
Xxx then you transfer the-
Xxx uh- a- a organic solution into a (RBF).

Xxx and do the ((unclear)).
Xxx and remove the aci-
Xxx remove the ((ether)).
Xxx which uh sol- which is solvent ok?
Xxx so here we have ((ether))-
Xxx and we have ((ester)).
Xxx ether is the solvent.
Xxx and ester is the product.
Xxx because the boiling point for these two are very slow.
Xxx are very low.
xxx sorry
Xxx so when you do the ((unclear))
Xxx when you ((unclear)) the ether some of your product
Xxx ((unclear))
Xxx so do the ((unclear)).
Xxx not to not to long times.
Xxx because next time.
xxx you you need to do some ehh-
Xxx you nee- you still need to do the distillation to
Xxx to get ester.
Xxx so we don't need ((no audio)).
Xxx all of your solvent which is ether.
Xxx just do a little bit.
Xxx ((no audio))
11:49
Xxx you just save uh the organic layer.
Xxx in you uh-
Xxx drawer?
xxx and next time you come here.
Xxx and you can do the ((unclear)) again.
xxx ok?
Xxx so
Xxx uh
12:00
Xxx S2: can I (just clarify a few things)?=
Xxx IS2: =sure.
Xxx S2: so you're gonna want
Xxx ((audio in and out – can't hear))
Xxx ((he is telling them to sacrifice a few bits of
Xxx organic layer))
Xxx that's about it

Xxx IS2: and also uh:
Xxx so you need to calculate the alcohol.
Xxx and the (acid you use)
xxx depending on your number.
Xxx because every-
Xxx every- every person here is not-
Xxx is synthesize different (ester).
Xxx so after you use the uh 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 today's experiment ok?
Xxx so the-
Xxx the acid is in the hood.
Xxx so which in- which is in the ((unclear)).
Xxx but the alcohol-
xxx so if the- you calculation is right.
Xxx and the-
Xxx just go the stock room and get the alcohol you want.
Xxx for (your specific ester).
Xxx ok?
Xxx S3: ((someone asks a question about alcohol))
Xxx so if you have too much alcohol you pour it out?
xxx they said that right?
xxx yea they said that.=
Xxx IS2: =ok
Xxx S3: you if when you get your alcohol from the stock
xxx room,
Xxx you don't use it all just (write down how much you
xxx had).
Xxx I think.
xxx that's what they said.
Xxx S4: yea because your (.) alcohol ((unclear))-
Xxx S3: yea exactly.
Xxx IS2: also you need to prepare a very clean vial.
Xxx for the for next week's experiment ok?
Xxx S5: (clean it today and leave it out) ((unclear))
Xxx IS2: just leave it dry and uh-
Xxx wash with water,
Xxx and then wash with acetone,
Xxx and uh put it in a drawer and let it dry.

Xxx ok?
Xxx and uh:
Xxx ssssss
Xxx I think it’s enough.
Xxx ok?
Xxx ((everyone starts to disburse))
Xxx so do the calculation first.
Xxx with the-
16:25
Xxx S5: so my calculations=
Xxx IS2: =ok
Xxx which acid.
Xxx S5: so I'm using (propionic acid),
Xxx IS2: so what’s the amount for you=
Xxx S5: =seven
Xxx IS2: yea it’s right.
COM and the alcohol?
Xxx S5: alcohol?
Xxx oh ok.=
Xxx IS2: =ok
Xxx S5: I thought we just use what's in our (vial).
Xxx IS2: yea this is the alcohol you use today.
Xxx just give me the amount.
Xxx S5: oh ok so (4.6)?
Xxx IS2: u:h:
Xxx S5: uh:
Xxx IS2: let me see ((grabs))
Xxx S5: [yea it is
Xxx IS2: [yea
Xxx ((whisper methyl propane))
Xxx yea its right.
Xxx S5: ok thank you!
Xxx IS2: yep
17:44
Xxx S6: did I do my calculations right for how much I need?=
xxx S7: =u:m:=
xxx six grams of the (acetic) acid that’s one mo-
xxx point one mole of the- of the uh:-
xxx the ((unclear))-
Xxx IS2: so:
Xxx S6: and then uh

Xxx .05 moles of [the um-
Xxx S7: [yea
xxx yea that seems right.
Xxx but you have to get the (acetic) acid in milliliters,
Xxx because it's liquid,
Xxx S6: oh
Xxx S7: yea
Xxx [((unclear))
Xxx IS2: [of of the acid and the alcohol
Xxx [((unclear)) liquid in the ((unclear))
Xxx S7: [yea
Xxx S6: oh no I didn't do the volume.=
Xxx S6: =yea
Xxx IS2: you have the the density in your manual.
Xxx S6: yea
Xxx S7: (but he was right with the grams).
Xxx cause it gives you grams right?=
Xxx IS2: =do you have this?
Xxx S7: >yea I have it I have it<
Xxx IS2: yeah cause I have several of them.
Xxx S7: ((unclear))
Xxx IS2: one is for you:
Xxx because this is from last semester.
Xxx S7: yea I remember getting them.
Xxx IS2: I got a lot.
Xxx S7: he got this right.
Xxx IS2: yea this is=
Xxx S7: =yea
Xxx IS2: the gram is right.
Xxx ((walks away))
18:54
Xxx IS2: what's the calculation?
Xxx S8: I'm doing it right now.
Xxx IS2: you should just transform into the: volume.
Xxx because both the acid and the (.) alcohol (.)
Xxx are liquid.
Xxx S8: do it by volume not=
Xxx IS2: yea you need to use the density.
Xxx and change the gram-
Xxx change the mass into the uh-
Xxx into the volume.

xxx ok?
Xxx S8: ok got it thank you.
19:19
Xxx IS2: good?
Xxx S9: I'm not quite sure how to do the:-
Xxx the calculation.
Xxx IS2: what eh uh-
Xxx S9: ((science names))
Xxx IS2: so uh:-
Xxx the acid you need to use is uh-
Xxx is ((unclear)) acid ok?
Xxx and uh for alcohol-
Xxx you need to use the (3-methyl butanol).
xxx right?=
xxx S9: =yea.
CLF IS2: so you need to use this to-
CLF and uh-
CLF so ((flipping pages))
xxx S9: point one mole?
Xxx IS2: so for the uh-
Xxx point one nole,
Xxx and for the alcohol point uh- zero-
Xxx [point o five right?
Xxx S9: [point 5
Xxx IS2: just based on this ((unclear)),
Xxx times the (molecular weight),
Xxx you got the mass right.=
Xxx S9: =yea
Xxx IS2: and divide by the density
Xxx and you got the volume.
xxx right?
20:17
Xxx yep!
Xxx so: which acid?
Xxx S10: ((unclear))[((unclear))
Xxx IS2: [so:
Xxx >yea yea yea< it's true.
Xxx that's right.
COM so: what's the volume for the butane alcohol?
Xxx S10: butane alcohol.
Xxx IS2: butane this.

Xxx S10: 3.7
Xxx IS2: so yea it’s right.
Xxx and for the acid?
Xxx S10: 5.7
Xxx IS2: it’s acid acid.
Xxx yea it’s right.
Xxx so for the acid right.
Xxx for the alcohol because this mass.
Xxx so the the alcohol is alcohol is liquid too.
Xxx so just using the density value,
Xxx change this to the volume.
Xxx and you got how- the volume.
xxx you want.
Xxx S10: so this divided [density
Xxx IS2: [density yes
Xxx S10: so after I-
Xxx I mean the alcohol isn’t it ((unclear))?
Xxx IS2: ((unclear))
Xxx S10: so [I should go-
Xxx IS2: [just check uh
Xxx go to the stock room and got the alcohol you want.=
Xxx S10: =uhuh
Xxx IS2: just tell them uh which alcohol.=
Xxx S10: =uhuh
Xxx IS2: you are using today.
Xxx S10: yea and they give the-
Xxx IS2: alcohol.
Xxx they give a liquid.
Xxx and just-
CLF (using) all of them.
CLF S10: so I don’t need to measure the volume or the: weight?=
CLF IS2: =yes
CLF got it?
CLF S10: yea I don’t need to measure it?
CLF IS2: yea because the amount you are using-
xxx are is- uh is- uh is uh- exactly from-
Xxx the ((unclear)).
Xxx S10: ((unclear))-
CLF IS2: yes.
CLF just if you got the right alcohol,
CLF they got the right amount of alcohol.

CLF S10: so I need to measure only the-
xxx [acid
Xxx IS2: [acid
xxx yea=
Xxx S10: =ok
22:00
Xxx S11: I think they were waiting first.
Xxx IS2: oh you-
Xxx S12: yeah I need you check my [calculations.
Xxx IS2: [oh sorry!
Xxx S12: it’s fine
Xxx um
Xxx IS2: so what’s your acid?
Xxx S12: I have um ((unclear)).
Xxx IS2: ((unclear)) is it 7.5 mil?
Xxx S12: no it’s not what I got
Xxx IS2: ok so for the alcohol.
Xxx so what's your calculation?
Xxx how you calculate wrong?
Xxx I check the ((unclear)) wrong with your-
Xxx S12: uh: here it is.=
Xxx IS2: =I think you got the right uh-
Xxx alcohol and acid.=
Xxx S12: =yea
Xxx IS2: so based on the mole,
Xxx and based on the molecular weight,
Xxx and you need to go the mass right?=
Xxx S12: =yea
Xxx IS2: and then you need to divide by the density.
Xxx you got the mil.
Xxx you got the mil.=
Xxx S12: =ok
Xxx IS2: and it’s the same thing for the alcohol too.=
Xxx S12: =ok
Xxx IS2: ok=
Xxx S12: =ok
xxx IS2: just double check
xxx and uh- mhm?
22:50
Xxx S13: I got really low numbers.
Xxx I probably did something wrong.

Xxx so I took the density,
Xxx and multiplied it by molecular weight to get grams,
Xxx then divided by the number of moles I need.
INR IS2: this is the uh: ester?
INR S13: this [is the acid and this is the alcohol.
INR IS2: [ah sorry is this the acid?
Xxx this is the acid uh-
Xxx I think something wrong with-
xxx S13: yea
Xxx this is the density right?=
Xxx S13: =mhm
Xxx IS2: [Let me check
Xxx S13: [I have the numbers right-
Xxx IS2: which- which-
Xxx S13: this is the (acetic) acid,
Xxx IS2: and then this is the molecular weight.
xxx right?=
Xxx S13: =mhm
Xxx IS2: let me do this.
xxx so for the acid
Xxx you have this mole right?=
Xxx S13: =mhm
Xxx IS2: and you times molecular weight right?=
Xxx S13: =mhm
Xxx IS2: and this is the flaks you need to use-
Xxx and you need to divide it by the-
Xxx S13: oh I see what I did.
Xxx IS2: this this is the right equation.
xxx ok?
Xxx for the alcohol it’s the same.
Xxx I think the alcohol sho-
Xxx S13: point zero
Xxx IS2: right?
Xxx and you times the molecular weight,
Xxx which is-
Xxx S13: 88=
Xxx IS2: =ok
Xxx 88
xxx and the you divide it by the density.
Xxx S13: .81 I believe.
xxx I think.

Xxx yea .81
Xxx IS2: and you got the volume.
xxx ok?
Xxx S13: got it.
xxx thanks so much.
Xxx IS2: yep
24:27
Xxx S14: I got ((science))
Xxx IS2: just give me the amount,
Xxx this is acid right,=
Xxx S14: =yea
Xxx IS2: acid is ((unclear)) is right?
Xxx for alcohol which one?=
Xxx S14: =.6
Xxx IS2: ((name)) right
Xxx ok it’s right.
xxx ok that’s good.
24:53
Xxx S15: I just have a question about my calculations,
Xxx IS2: so for which acid did you use?
Xxx S15: (acetic) acid?
Xxx IS2: acid- acid is right,
Xxx you got the right number,
Xxx for the alcohol which alcohol?
Xxx S15: butanol,
Xxx IS2: butano::l yeah it’s right!
25:30
Xxx IS2: I can check.
Xxx did you finish?
Xxx S16: I need help because I don’t know to um- solve it.
Xxx I know which one I need,
xxx which is this,=
Xxx IS2: uhuh
xxx S16: I know I need that one,=
xxx IS2: =uhuh
Xxx S16: but I don’t know how to [sol-
Xxx IS2: [calculate?
Xxx S16: solve yea
Xxx IS2: so for the mole- you need to know-
Xxx this is the mole you need to add right?
Xxx can I write here?

Xxx S16: mhm
Xxx IS2: so for the acid you have this mole,
Xxx and you need to calculate
Xxx times the uh- molecular weight
Xxx for the uh- acid.
Xxx which acid?
Xxx (acetic) acid?
Xxx and this one right?
Xxx (acetic) acid you need to use right?=
Xxx S16: =y:ea?
Xxx IS2: so wh- which acid did you use?
Xxx S16: I have this one.
Xxx IS2: so: ok it's right.
Xxx this is molecular weight,
Xxx and you need to times 60,
Xxx and this is mass right?
Xxx and you need to divide by density of th- of the acid.
Xxx which is here,
xxx and you got the volume.
xxx ok?=
Xxx S16: =mhm
Xxx IS2: and for the alcohol-
Xxx yup it is the same thing,
Xxx S16: I'll do this.
Xxx IS2: ok
Xxx S17: so we turned the black valve,
xxx and I don't know that that is,
xxx and there's like brown liquid in the hood,
26:41- ((unclear))
27:11
xxx S17: for the alcohol,
xxx for the alcohol we're measuring a-
xxx an empty vial.
xxx and then we're transferring ((unclear)) into it and
xxx weighing it?
xxx IS2: no. so-
Xxx this is alcohol you have right?
Xxx S17: oh! yea sorry.
Xxx S2: so you need to weight-
xxx ok.
xxx S17: weight this?=

xxx IS2: =yea
xxx so-
xxx basically the thing you need to do is-
xxx so you get out of the ((unclear)),=
xxx IS2: =ok
xxx ((unclear))
xxx and you get some of them out,
xxx and you weight the rest of this amount,
Xxx IS2: and you know how much of the alcohol you transfer
Xxx already.
Xxx S17: o:h
xxx so 3.7 grams.
Xxx so I'm going to weight it,
xxx and I'm gonna-
Xxx IS2: so basically you need to weight first,=
Xxx S17: =right
Xxx IS2: the total weight before you transfer right?
Xxx and you got a number.
Xxx and then you transfer a little bit out,
Xxx and you weight the rest of them.
Xxx ((unclear))
Xxx and you know how much you have transfer.
Xxx and this is you need to do.=
xxx S17: = alright
28:18
Xxx S18: um is this right?
Xxx IS2: so for which acid?
Xxx S18: my acid i:s
xxx (acetic)?
Xxx IS2: is this amount?
Xxx S18: oh I just want you to check-
Xxx IS2: oh ok.
xxx this is right.
Xxx and you divide by density.=
Xxx S18: =yea
Xxx IS2: yea this is acid.=
xxx S18: =ok
Xxx you got it.
Xxx and for the same thing
Xxx for the alcohol too.
Xxx S18: just wanted you to check.

Xxx ok ok and divide by density.
Xxx if you got density call me.
28:44
Xxx s19: this is (acetic) acid,
Xxx IS2: (acetic) acid is right?
Xxx S19: (methyl butol)
xxx IS2: two (methyl butol)-
Xxx S19: three (methyl butol)-
Xxx IS2: yea it’s right.
28:55
xxx S20: if they have too much alcohol they just use it all
xxx right?
Xxx ho- how do they get the right amount of alcohol?
Xxx they need to weigh-
xxx we- weight whole ((unclear)) first,
Xxx so for the alcohol you need to use the: mass.
Xxx I mean-
Xxx S20: density.
Xxx IS2: no for the alcohol.
Xxx S20: >yea yea<
Xxx IS2: mass
Xxx for the for the acid they use volume right?
Xxx so-
xxx I- I- I just need to check the alcohol.
Xxx for the weight.
Xxx we don’t need to check the volume right?
Xxx S20: yea it’s usually the weight but-
Xxx S21: the alcohol is just the weight.
Xxx IS2: just the weight-
Xxx S21: because they’re gonna ((audio problem))
Xxx IS2: so basically for every people they should have-
Xxx they should have some alcohol left in the vial right?
Xxx ((audio problems))
Xxx use all of them really?
Xxx S20: it says uh- if there’s more than needed just use it
all
COM IS2: ok let me
COM it means the more-
COM it more is not is enough
COM because a little
COM a little bit right?

Xxx S20: well what do you mean?
Xxx IS2: the reason why is they use all of them because-
Xxx the alcohol after they got the right amount.
Xxx based on their calculation.
Xxx yea if they have [extra
Xxx [a little bit
Xxx S20: a little bit.
Xxx [just ((unclear))
Xxx IS2: [use it all
Xxx S20: just use it all
Xxx IS2: yea yea yea
Xxx S20: but if they have too little then they have to go
Xxx back (get and more).
30:30
Xxx IS2: ok
Xxx yep so this is the acid,
Xxx you go the right number,
Xxx for the alcohol,
Xxx which is ((science)) right?=
Xxx S22: =uhuh
Xxx IS2: ok go!
30:38