[BEAKER STIRRING]

[LAUGHTER]

[MUSIC PLAYING]

ANNOUNCER: It's day two of 5.301. The students are given a tenth of a gram of Ethyl 3-hydroxybenzoate contaminated with a small amount of triethylamine. The goal is to separate the contaminant from the target chemical using a technique called extraction. The students first dissolve the mixture in ether, then they add an acid solution.

Acid and ether don't mix, so two layers form. As the students shake the mixture, the acid reacts with the contaminant to form a salt. This salt is much less soluble in ether than it is an acid, so it moves from the ether to the acid. The two liquids separate back into two layers. Overall, the target molecule stays in the ether and the contaminant moves to the acid layer.

ANTHONY: This has my product. This has my impurity.

ANNOUNCER: Now it's time to head over to the rotovap to evaporate the ether. Anthony starts rotovapping, and it's all going well, for now. But after a while--

ANTHONY: I'm not getting any of my dried sample on the edges. I think as long as there is still ether in there, then I won't get anything to show up, is what I'm hoping.

IKE: His was a lot and it's not succeeding. Mine is little, so what chance do I have?

ANTHONY: I thought I did something wrong and, of course, no one wants to do anything wrong, especially on the second day. I should have gotten some product. I went to Tengfei, and I was like, look lady, I don't know you very well but this doesn't seem like it's working. She drained the solvent and then turned on the vacuum again. I still don't see anything. Everyone else was getting their samples and they were going to dry and then mass. And I was like, I don't have anything.

ANNOUNCER: Anthony's troubles finally get Phil's attention.

PHIL: Try putting it on one of the other rotovaps.

ANNOUNCER: Phil thinks the rotovap Anthony is using must be broken.

ANTHONY: And I start getting crystals, I guess, on the side of my round bottom. I clutched my heart. And I was like, finally.

ANNOUNCER: But the sample doesn't quite look right, and Tengfei has something to say about that.

TENGFEI: Who's to know what you are supposed to get?

ANTHONY: So she's like, calm down. Like, just hold on. You don't even know what you're supposed to get yet, so hold on.

ANNOUNCER: Anthony runs an NMR to figure out exactly what he has.

ANTHONY: Check this out. This doesn't look like it's horribly wrong. So, hopefully this will be it. I think this is a pretty good NMR scan.

ANNOUNCER: Even though his sample looks different, the NMR spectrum matches that of the pure compound.

ANTHONY: 70% yield. So not wonderful, but not too bad. When I got a sample and I got a pretty big yield and it was pretty pure, I was happy.

ANNOUNCER: And that's it. The first day is done.

EMILY: Overall, I think the lab was OK. It was a little stressful at times, but we all made it though it alive and I think it will just get easier with each day as we become more comfortable with what we're doing.

ETHAN: I'm definitely not as nervous anymore to go to the lab. I'm actually more excited for it, I guess.

ANTHONY: I'm looking forward to tomorrow. It's going to be a lot harder, but I think it's going to be a lot of fun.

PHIL: I'm not a gambling man. I do slot machines.

[MUSIC PLAYING]