

How to make pills or pellets

Pellets can be one method to compact the sample before baking. Keeseong usually doesn't use this technique, only when he has to use the high pressure oxygen oven.

Pellets are useful to measure: Resistivity, Magnetization, Thermal conductivity, Heat capacity.

For this case we are going to make a 1/8" diameter pellet.

The material is: $x = 1$ $Ca_{2+x}Y_{2-x}Cu_5O_{10-\delta}$ or $Ca_3Y_1Cu_5O_{10-\delta}$

The holders for pellets making are found below the press.



These pieces should be cleaned with Acetone at least 4 times top, bottom, Base and the hole should be cleaned with Cotton Tip applicators. The piston with Kimwipes should be cleaned with Acetone at least 5 times.

For the cleaning of the pieces use always gloves

For each diameter we will use different pressures and quantity of material

1/8" diam	100mg	1000 lb
3/8" diam	300mg	2000 lb
1/4" diam	500 mg	5000 lb

We will place a weighing paper in the scale and we will set the scale to 0. Slowly we will add the sample to the weighing paper until we reach the 100mg



After we reach the desired quantity, we will put the entire sample into the cylinder.



We will use another weighing paper to push any sample left on the top of the cylinder into the hole.



After the entire sample is into the cylinder we will spin the cylinder group the sample inside the cylinder. After this we will procedure to introduce the small cylinder (piston) into the hole.



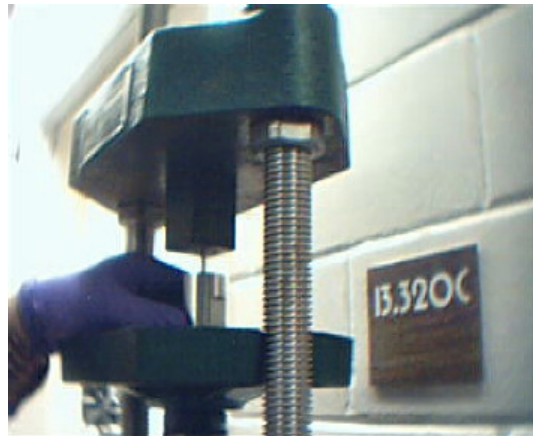
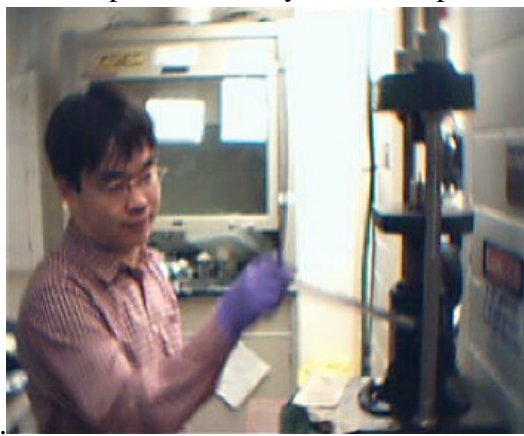
We will scratching very gentle the inner walls of the cylinder pushing the sample that could be stick at the inner surface. Finally we will leave the piston into the cylinder.

The next step is to press the sample. In order to do that we will use the Green Carver Lab Press





We will put the base cylinder and piston on the press and



Just when the piston barely is touching the top of the press... we must look for the perfect collocation of the piston. The top surface of the press is not perfectly plane. It makes a small concave surface, so we must make the piston to touch the deepest part of the press.



Once this is achieved, we will start increasing the pressure until 1000 lb.



This pressure will be decreasing as the crystals reduce their volume. We will be trying to keep this pressure in 1000lb and once this pressure remains constant after 2 or 3 min we will remove very slowly the pressure.



Now we must take the pill from the cylinder carefully enough to extract it without damage. The tool that we are going to use is:



We will put a Kimwipe inside



The main idea is to use the press to remove the pill from the cylinder and avoid the piston to fall and damage the pill.



To avoid the piston to fall, we must apply a lateral force to the piston at the same time that we use the press.



The pill will fall to the Kimwipe and the piston will remain hold by our finger.

The next step is to extract the pill from the cylinder and put it on the boat.\





We will make between 4 and 5 pills. The reason is that we want several samples to make as many test as possible.