

10/24/2017

Tasklist:

- Characterize Clay using XRD
  - Prepare clay supported AuNP
  - Characterize Au/TiO<sub>2</sub>
  - Use TiO<sub>2</sub> to selectively oxidize an alcohol
- 

➤ Characterize Clay using XRD

-Step 1: The clay samples were washed with 10mL aliquots of water and ethanol. After washing, the samples were centrifuged. This process was repeated five times.

-Step 2: The clay was thinly spread onto watch glasses and placed into the oven at 105 degrees C.

-Step 3: The samples were then ground into a powder via mortar and pestle.

-Step 4: The samples were placed into the X-ray diffraction machine between 2 degrees C and 50 degrees C.

---

➤ Prepare clay supported AuNP

Our clay samples did not reach a weight of 0.3g. Thus, our group did not create clay-supported AuNPs.

---

➤ Characterize Au/TiO<sub>2</sub>

-Step 1: The AuNP/ TiO<sub>2</sub> was heated.

-Step 2: The sample was then ground using a mortar and pestle.

-Step 3: The Au/TiO<sub>2</sub> was placed into the XRD machine between 2 degrees C and 50 degrees C. The data produced is shown in figure 1 below.

-Step 4: 0.2g of Au/TiO<sub>2</sub> was placed into a 100mL round-bottomed flask with ~1g of glycerol, ~29mL of methanol, and 0.75g of NaOH.

-Step 5: A balloon was filled with ~500mL of oxygen.

-Step 6: Half a teaspoon of yeast that included 10mL of 3% H<sub>2</sub>O<sub>2</sub> was then placed into the flask. The flask was covered with a holed stopper.

-Step 7: The balloon was connected to the mouth of the flask.

-Step 8: The reaction was left for overnight to be stopped at a later time.

-Step 9: After 2 hours, the balloon was removed, and the sample was centrifuged.

Figure 1: XRD of the Au/TiO<sub>2</sub> Sample

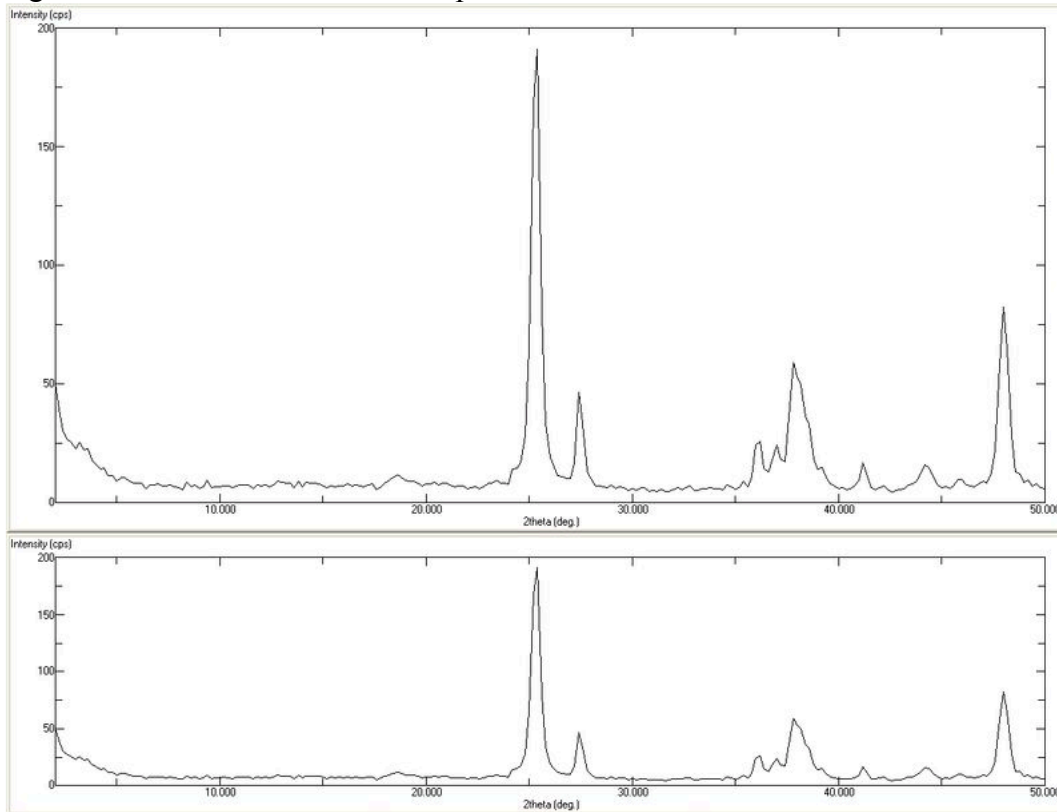


Figure 1 shows the XRD of the Au/TiO<sub>2</sub> sample. The figure contains two graphs with matching peaks. The top graph's peaks are steeper than the second graph.