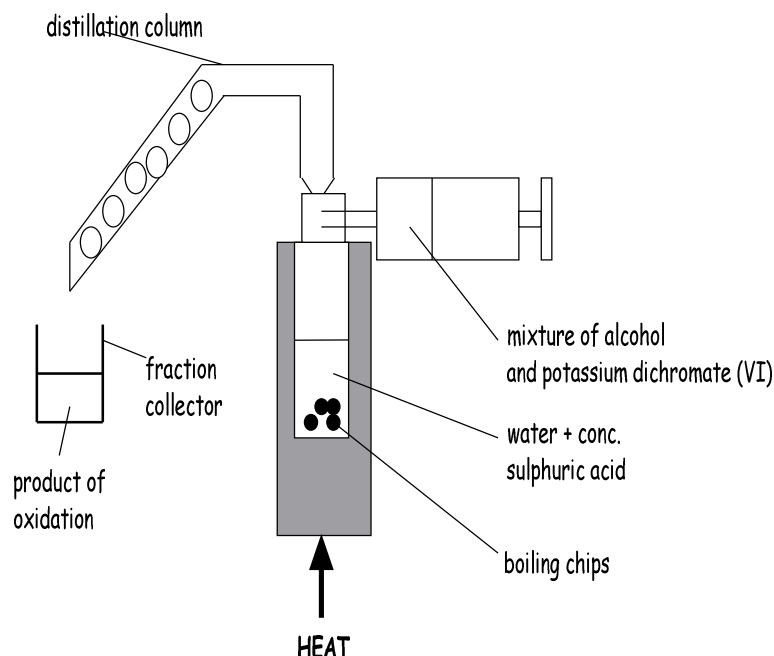


## What compounds are formed by the oxidation of primary and secondary alcohols?

### Method



### Preliminaries

1. Make sure that the reaction vessel and the heating vessel are fitted with their sealing rings and that there is a sealing ring in the top of the adaptor for the distillation column.
2. Place boiling chips in both vessels.

### Instructions

1. Add 15 drops of water to the inner reaction vessel.
2. Place the reaction vessel in a small amount of water in a 100 cm<sup>3</sup> to cool it and slowly add 5 drops of conc. sulfuric acid (CARE!).
3. Connect the inner reaction vessel and the heating vessel to the apparatus as shown.
4. To one of the larger wells of the Comboplate add 1 cm<sup>3</sup> of water.
5. Using a microspatula add 2 scoops of potassium dichromate and stir using your microspatula until it has dissolved.
6. Slowly add 15 drops of either propan-1-ol or propan-2-ol to the orange solution and stir well. Repeated sucking in and out using the syringe is a good way to do this.

7. Suck up this solution into your syringe and attach the syringe to the Combostill as shown so that the syringe fits into the hole usually used for the thermometer.
8. Heat the apparatus using your spirit burner.
9. When the sulfuric acid is boiling, slowly add the dichromate-alcohol mixture and continue heating so that a liquid comes over into the fraction collector.
10. Test the resulting distillate using 2,4-dinitrophenylhydrazine using the propan-1-ol (or propan-2-ol) as a control.

## **Oxidation of alcohols—RESULTS and CONCLUSIONS**

### **RESULTS**

What did you observe during the reaction and distillation?

---

---

Give the results for the testing of the alcohol and product using 2,4 dinitrophenylhydrazine. \_\_\_\_\_

---

### **CONCLUSIONS**

1. Explain why the oxidising agent was not used in excess in this reaction. \_\_\_\_\_  
\_\_\_\_\_
2. Why was the reaction mixture distilled immediately and not refluxed?  
\_\_\_\_\_  
\_\_\_\_\_

Write balanced symbol equations for the two reactions in the space below:-

3. Using your textbook or the Internet describe how you could test the products to identify the product as an aldehyde or ketone.

---

---

Carry out this test and give the results

TEST USED \_\_\_\_\_

Results for test \_\_\_\_\_

---

---

Complete the following paragraph.

When a primary alcohol is partially oxidised to a/an aldehyde/ketone is

formed. This forms a \_\_\_\_\_ mirror with Tollen's reagent. A

secondary alcohol is oxidised to a/an aldehyde/ketone.

Another test that can be used is to warm the product with \_\_\_\_\_

potassium dichromate. A/an aldehyde/ketone will be oxidised by the

\_\_\_\_\_ potassium dichromate to give a \_\_\_\_\_

acid. The \_\_\_\_\_ will not react.