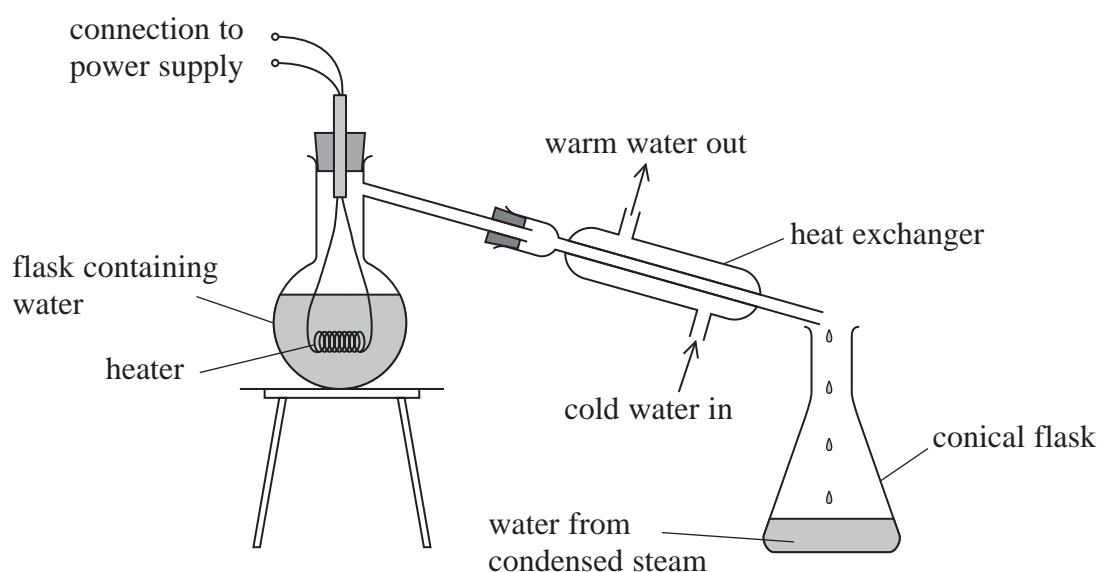


The apparatus shown can be used to determine a value for the specific latent heat of vaporisation of water.



- (a) In one experiment the current in the heater was 8.20 A, and the potential difference across the heater was 230 V.
- (i) Show that the power of the heater was about 2 kW. (2)

- (ii) There was 0.655 kg of water in the flask at an initial temperature of 22.5 °C. The heater was switched on, and the water in the flask was heated to boiling point. Calculate the minimum time taken for the water to be heated to 100.0 °C. specific heat capacity of water = 4190 J kg<sup>-1</sup> K<sup>-1</sup> (3)

- (b) The heater was left on and water continued to boil in the flask. The water was allowed to boil for a few minutes. The conical flask was then placed under the heat exchanger and water was collected in it.
- (i) Give a reason why the water was left boiling for a few minutes before the conical flask was put in place. (1)

- (ii) Water with a mass of 95.0 g was collected in a time of 125 s. Calculate the rate of energy transfer in the heat exchanger. specific latent heat of vaporisation of water = 2.26 × 10<sup>6</sup> J kg<sup>-1</sup> (3)

- Rate of energy transfer in the heat exchanger = .....
- (iii) Discuss your answers to (a)(i) and (b)(ii). (3)

- (c) State how the apparatus could be modified to minimise the effect of a significant source of error. (1)