



AS 1.2/A

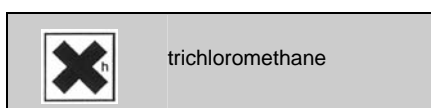
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## DETERMINATION OF THE $M_r$ OF A VOLATILE LIQUID

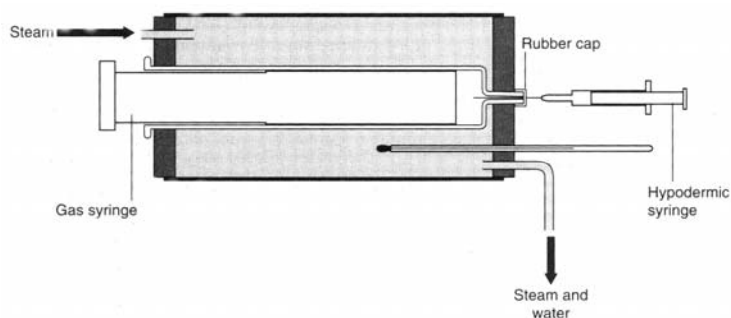


Aim You are going to find the  $M_r$  of a volatile liquid, trichloromethane, by measuring its volume as a gas and using the ideal gas equation. Your teacher will show you the experiment which you will then analyse and evaluate.

Safety



Method 1) Place about  $5 \text{ cm}^3$  of air into the large syringe in the steam jacket and seal it with the rubber cap.



- 2) Pass steam through the steam jacket until the temperature reading and air volume reach steady values.
- 3) Place some trichloromethane in a hypodermic syringe, ensuring there are no air bubbles by ejecting a little vertically.
- 4) Dry the outside of the hypodermic needle and then find the mass of the syringe and liquid.
- 5) Once the syringe in the steam jacket is ready, record the air volume and then inject about  $0.2 \text{ cm}^3$  of trichloromethane into the large syringe and remove the small syringe.
- 6) Find the mass of the small syringe again to calculate the mass of trichloromethane added.
- 7) Once the volume in the large syringe has stabilised, record the volume, temperature and pressure (use the barometer in S14) of the vapour.

Results 8) Record your results in a suitable table below.



13) Do you believe your results are accurate? Explain your answer.

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14) How could you improve the reliability of this result?

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15) Do you believe the apparatus you used was precise enough? Explain your answer, and if not, what would you have used instead?

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16) One common error when doing this experiment is not leaving the apparatus long enough to heat up to 100°C. Why is this a problem and what effect would it have on the  $M_r$  calculated?

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17) Another common error when doing this experiment is not sealing the hypodermic syringe needle with some rubber while weighing this syringe. Why is this a problem and what effect would it have on the  $M_r$  calculated?

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