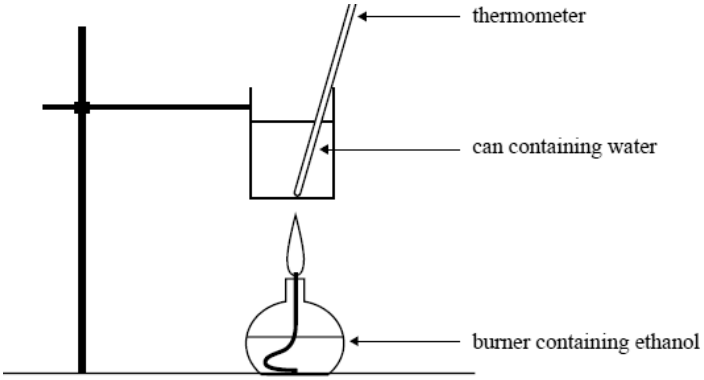
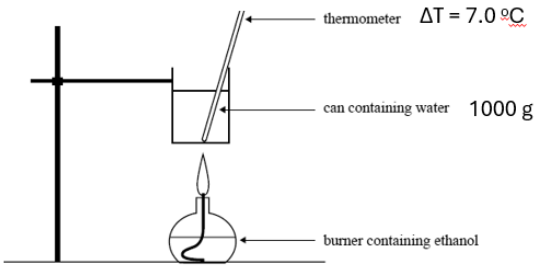
1. An unknown liquid fuel was placed in a spirit burner and weighed on an electronic balance at 137.8 grams. The spirit burner was then used to heat 100mL of water at 25.0 °C to 42.8 °C. After a certain amount of time the spirit burner was extinguished and reweighed. It was found to have a mass of 133.8 grams. Calculate the energy content of the fuel in J/g.

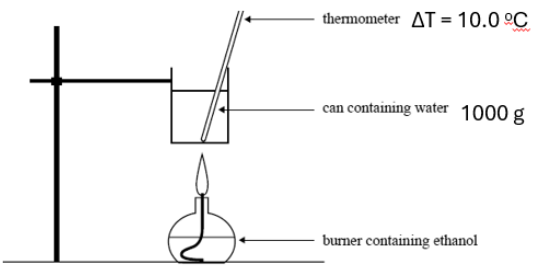


2. An unknown liquid fuel was placed in a spirit burner and weighed on an electronic balance at 143.0 grams. The spirit burner was then used to heat 200mL of water at 25.0 °C to 45.0 °C. After a certain amount of time the spirit burner was extinguished and reweighed. It was found to have a mass of 135.0 grams. Calculate the energy content of the fuel in J/g.



Fuel A

Total mass of fuel A that completely combusted = 1.20 g



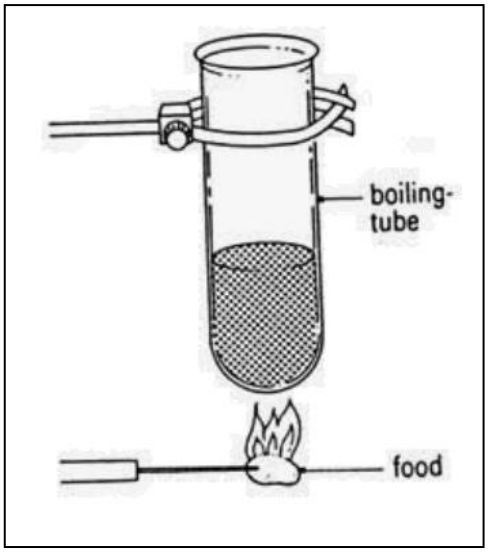
Fuel B

Total mass of fuel B that completely combusted = 3.60 g

3. Above are the results of the analysis of two fuels. Which fuel is best used in a high-performance racing car? Justify you answer

4. A test tube filled with 40.0 mL of water, at 25.0 °C was heated with the energy released from a burning peanut and reached a final temperature of 31.0 °C. A mass of 2.01 grams of peanut was completely burnt.

   What is the energy content of the peanut in J/g. The literature value for this brand of peanuts is 2500 J/g.
   Are the results accurate? Explain why the results differ from the literature.



5. A peanut sample weighing 20 g is completely burned to heat 200 g of water. in a can, initially at 25.0 °C. After combustion, the water temperature rises to 35.0 °C. Calculate the energy released by the peanuts and determine the energy density in kJ/g. Discuss any assumptions and the validity of using only water's specific heat in this calculation.

6. In an experiment, burning 30 g of peanuts raises the temperature of 500 g of water by 15°C. Calculate the total energy released and the energy density of the peanuts in kJ/g. How would heat losses affect this calculation and what improvements could be made to increase accuracy?