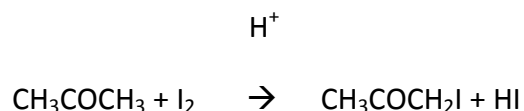


## Determining rate of reaction

**Aim:** To deduce the rate equation for the following reaction:



The reaction is catalysed by acid.

FB1 is an aqueous solution of iodine

FB2 is a solution of a propanone. Keep this stoppered.

FB3 is 1.00 moldm<sup>-3</sup> sulphuric acid

FB4 is 0.5 moldm<sup>-3</sup> sodium hydrogencarbonate

FB5 is 0.01 moldm<sup>-3</sup> sodium thiosulphate.

- (a) Use a burette to measure 50.00 cm<sup>3</sup> of FB1 into a dry titration flask(label this A). Into another dry titration flask (labeled B) pipette 25 cm<sup>3</sup> of FB2 followed by 25 cm<sup>3</sup> of FB3. Note the time (or start the stop-clock as you pour the contents of flask B into flask A. stopper the flask and shake well for about one minute. By using a pipette fitted with a safety filler, pipette three separate 10.0 cm<sup>3</sup> samples of the reaction mixture and place one sample in each of three flasks labeled 10, 20, and 30 min respectively. Measure 10 cm<sup>3</sup> of FB4 in a measuring cylinder. At exactly ten minutes after first mixing add the 10 cm<sup>3</sup> of FB4 to the flask labeled '10 min'. Shake the flask until effervescence stops. Titrate the contents of the flask with FB5 using starch as indicator near the end point.

The results

Time after start of reaction	0 min	10 min	20 min	30 min
Between iodide and propanone				
Volume of FB5 required for Titration/ cm <sup>3</sup>	17.0	12.1	10.4	9.5

- (b) Construct a graph of time against volume of FB5  
(c) From your graph predict the volume of FB5 which would have been required to react with a 10 cm<sup>3</sup> sample of the reaction mixture after 40 mins.  
(d) Suggest why FB2 must be kept in a stoppered bottle  
(e) The reaction between iodide and propanone is stopped by the addition of sodium hydrogen carbonate. Explain why.