

Rate(speed) of Reaction

Mark Scheme 2

Level	IGCSE
Subject	Chemistry
Exam Board	CIE
Topic	Chemical Reactions
Sub-Topic	Rate (speed) of Reactions
Paper Type	Alternative to Practical
Booklet	Mark Scheme 2

Time Allowed: 59 minutes

Score: /49

Percentage: /100

- 1 (a) Table of results for Experiments [5]
- all initial temperature boxes completed correctly (2)
- 25 41 47 62 72
- all final temperature boxes completed correctly (2)
- 23 27 39 42 48
- average temperatures completed correctly (1)
- 24 34 43 52 60
- (b) points plotted correctly (4) [5]
- smooth line graph (1)
- (c) value from graph at 72 °C (1) \approx 30–35 s [2]
- extrapolation shown on grid (1)
- (d) as an indicator owtte/check iodine present (1) [1]
- (e) (i) experiment 5 (1) [1]
- (ii) highest temperature (1) [2]
- particles have more energy/more collisions/move faster (1)
- (f) time longer/more/increase (1) [2]
- speed slower/decrease (1)
- (g) more accurate (1) [1]

- 2 (a) idea of fair test / only one variable [1]
- (b) nitric acid [1]
- (c) (points plotted (3), -1 for each incorrect
smooth curve (1) [4]
- (ii) value from graph 18 s (1) indication on graph (1) [2]
- (d) times would be less / reaction quicker (1)
particles have more energy / increased collisions (1) [2]

[Total: 10]

3 (a) Table of results

initial temperature boxes completed correctly (2)	24	33	40	51	60	
final temperature boxes correctly completed (2)	24	31	38	47	54	
average temperature boxes correctly completed (1)	24	32	39	49	57	[5]

(b) 5 points correctly plotted (3), -1 for any incorrect smooth line graph (1) [4]

(c) (i) experiment 5 (1) 11J

(ii) more energy owtte (1) particles move faster (1) more kinetic energy= 2 more collisions (1) [3]

{d} idea of a fair test/lo compare effect of changing the terrperature **(1)** 11J

(e) (i) value from graph approx 20 (1) unit (1) extrapolation shown (1) (3)

(ii) curve sketched on grid below original curve (1) 11J

(f) change e.g. use of data logger/colourimeter (1) or use of lagging/insulation /repeat experiments or more values/use a burette or pipette

explanation e.g. timing of reaction more accurate (1) to reduce heat losses /average readings for times/volumes more accurate (2)