

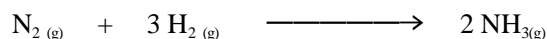
Quiz 1: Chemical Kinetics

“If it wasn’t for activation energy, things would move a lot faster around here!”

SCH4UE 2004-2005

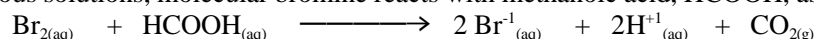
Name: _____

1. Consider the reaction:



Suppose that at a particular moment during the reaction molecular hydrogen is reacting at the rate of $0.074 \text{ mol dm}^{-3}$.

- a. At what rate is ammonia being formed? 2
b. At what rate is molecular nitrogen reacting? 2
2. In aqueous solutions, molecular bromine reacts with methanoic acid, HCOOH, as follows:



The rate of this reaction was investigated by some ardent chemists at 25°C . We have taken the following figures from their results:

Time (s)	$[\text{Br}_2]$ (mol dm^{-3})
0.0	0.0120
50.0	0.0101
100.0	0.00846
150.0	0.00710
200.0	0.00596
250.0	0.00500
300.0	0.00420
350.0	0.00353
400.0	0.00296

- a. Suggest two ways by which the rate of this reaction may be measured experimentally. 2
b. Plot a graph of concentration of bromine as a function of time on a well constructed graph. 5
c. When is the rate of the reaction greatest and when is it least? 1
d. Suggest one reason why the rate of reaction is changing? 2
e. Determine the instantaneous rate of decrease of concentration of bromine at:
(i) 125 s (ii) 225 s 4
f. What is the average rate of reaction for the first 100 s time interval. 2
g. Write an expression to express the rate at which the bromine concentration changes with time. 2
h. How does the reaction rate change with time? Explain. 2