Reaction Rates - Reading Guide

*section 12.1 in OpenStax*

**Rates of Chemical Reactions**

**Rate** = change in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ divided by change in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The general unit for rate is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

As time progresses, the concentration of the reactants \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (*decreases/increases*).

As time progresses, the concentration of the products \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (*decreases/increases*).

For the following reaction, express the rate with respect to A, B and C. The first one, A, is done for you.

 3A + 2B → 4C

 $Rate= – \frac{1}{3} \frac{∆[A]}{∆t}$

What does *t* represent in the above equations? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What do the brackets represent in the above equation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If the concentration of A decreases from 0.010 M to 0.005 M over a period of 100.0 seconds, show how you would calculate the average rate of disappearance of A.

(ans. 5.0 × 10–5 M/s)

Use your answer above to show how you would calculate the average rate of appearance of C.

(ans. 6.7 × 10–5 M/s)

**Instantaneous Rates**

The **instantaneous rate** of a reaction is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

How is the instantaneous rate different from the average rate of a reaction?

Show how you would calculate the instantaneous rate at 10.0 hours using the graph below.



(ans. 8.3× 10–3 M/h)

**End of 12 Chapter Practice Problems**

#3, 5a

For detailed solutions to these problems, go to the [OpenStax website](https://openstaxcollege.org/textbooks/chemistry/resources) and download the “Student Answer and Solution Guide.”