

GENERAL KINETICS

Take a general reaction:



$$\text{then, rate} = v = -\frac{1}{a} \frac{d[A]}{dt} = -\frac{1}{b} \frac{d[B]}{dt} = \frac{1}{c} \frac{d[C]}{dt} = \frac{1}{d} \frac{d[D]}{dt}$$

To understand this, put in some numbers, e.g. $a=1, b=2, c=2, d=0$

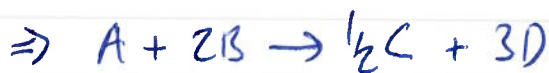
$$\text{then } v = -\frac{d[A]}{dt} = \frac{1}{2} \frac{d[C]}{dt} \quad \text{for } A \rightarrow 2C$$

-ve because
rate of consumption
of reactants

rate of consumption of A is half (i.e. twice as slow) as rate of production of C.

- This makes sense because we make 2 moles of C for each mole of A consumed. i.e. rate of production of C is 2x rate of consumption of A.

More complex: $a=1, b=2, c=1/2, d=3$



$$v = -\frac{d[A]}{dt} = -\frac{1}{2} \frac{d[B]}{dt} = 2 \frac{d[C]}{dt} = \frac{1}{3} \frac{d[D]}{dt}$$

measure other
rates relative
to this

A is used up
half as quickly as B

C is produced
half as quickly
as A is consumed

A is consumed 3 times more slowly than D is produced.