9. CHEMICAL KINETICS AND NUCLEAR CHEMISTRY

.111.. For a general chemical tramiormation

nA rn13 pf qD

Rate = -1 IAA] = -1 4:[0] = + ICINI 10'1E4
n dt rn aft p dt q dt

{2}. For elementary chemical reaction

rnA+ n13- - -1.-prcduds

Theoretical rate = dx/dt = k[Ar xl[Br

{311, For a general reaction ; 21 A -h blil Pr oducts

Rate = dx/cit = klAr x [Br

Order of reaction w.r.t. A = rn overall ceder of reaction = (m + n}

OrdEr Of reaction w. Lt. B = n

{4}. Unit of rate constant = {molar (litre)n4 time-3

Where, n = order of reaction

{511 For a zero order reaction ; A —.13

ikate -d[A] le O (corps Can t)

= AO -IA} / K

(6). For a first order reaction ; A ID

Rate - 711,114] / clt - kEA]

k = 2.303 , (P4 0 1 -30n / t , a / a - x)

Pp. For a zero order reactian, t1 r2 = 1A10

For a first order reaction, = .6gi

For an n" order reaction, t in = 1 / (Ai for n

{8.1'. For a parallel reaction

A

Ka

—dIA1 , +k,)[AI
dt =

Fora first order reart:on A ——A3 -rC r a reagent reacts with all A. B and -E

k = t —Vt {V • vol. of reagen0

{101. Temperature cuefilcient = Tro:Pc

Arrhenius €quation, k — V RT

k2 E5 [T =)
k., = (2.3.03 R) T,

log yer k = "gm. A Eo / 2_3□3 RT

A = Arrhenius's constant
E. = Aclivatiork energy

Ickgio k = I to A 2303 AT ED

112). Binding energy.. B.E= mx 931.5 MeV

am : mass cleiatt calculaked At. Mass —citiservcd At. Mass

13-.1E. per nucleon E. (total) / mass number

1 met = 9_6 M 10 1c1 Joule mar'

[13). Packing fra c do n_ P_F. = Isotopic atomic mass-mass no. / mass ruArwer xio6

(14). In a faditattilia decay, N = INfi eHt

Amount ɑI radioactive 5vInteric.e after 'in' periods

{15). Activity, A t — A =