Periodic Table of the Elements

1A 1	2A 2	3B 3	4B 4	5B 5	6B 6	7B 7	8	8B 9	10	1B 11	2B 12	3A 13	4A 14	5A 15	6A 16	7A 17	8A 18
1 H 1.0079																	2 He 4.0026
3 Li 6.941	4 Be 9.0122											5 B 10.811	6 C 12.011	7 N 14.0067	8 O 15.9994	9 F 18.9984	10 Ne 20.1797
11 Na 22.9898	12 Mg 24.3050											13 Al 26.9815	14 Si 28.0855	15 P 30.9738	16 S 32.066	17 Cl 35.4527	18 Ar 39.948
19 K 39.0983	20 Ca 40.078	21 Sc 44.9559	22 Ti 47.88	23 V 50.9415	24 Cr 51.9961	25 Mn 54.9380	26 Fe 55.847	27 Co 58.9332	28 Ni 58.69	29 Cu 63.546	30 Zn 65.39	31 Ga 69.723	32 Ge 72.61	33 As 74.9216	34 Se 78.96	35 Br 79.904	36 Kr 83.80
37 Rb 85.4678	38 Sr 87.62	39 Y 88.9059	40 Zr 91.224	41 Nb 92.9064	42 Mo 95.94	43 Tc (98)	44 Ru 101.07	45 Rh 102.9055	46 Pd 106.42	47 Ag 107.8682	48 Cd 112.411	49 In 114.82	50 Sn 118.710	51 Sb 121.75	52 Te 127.60	53 I 126.9045	54 Xe 131.39
55 Cs 132.9054	56 Ba 137.327	57 La 138.9055	72 Hf 178.49	73 Ta 180.9479	74 W 183.85	75 Re 186.207	76 Os 190.2	77 Ir 192.22	78 Pt 195.08	79 Au 196.9665	80 Hg 200.59	81 Tl 204.3833	82 Pb 207.2	83 Bi 208.9804	84 Po (209)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra (226)	89 Ac (227)	104 Rf (261)	105 Db (262)	106 Sg (263)	107 Bh (262)	108 Hs (265)	109 Mt (266)									

58 Ce 140.115	59 Pr 140.9076	60 Nd 144.24	61 Pm (145)	62 Sm 150.36	63 Eu 151.965	64 Gd 157.25	65 Tb 158.9253	66 Dy 162.50	67 Ho 164.9303	68 Er 167.26	69 Tm 168.9342	70 Yb 173.04	71 Lu 174.967
90 Th 232.0381	91 Pa 231.0359	92 U 238.0289	93 Np (237)	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (260)

This print-out should have 30 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering. The due time is Central time.

Msci 21 2113
20:08, general, multiple choice, > 1 min, fixed.
001

Consider the voltaic cell

$$Ga \mid Ga^{3+}(1\ M) \mid\mid Ni^{2+}(1\ M) \mid Ni$$

$Ga^{3+} + 3\,e^- \rightarrow Ga$ $E^0 = -0.560$ V
$Ni^{2+} + 2\,e^- \rightarrow Ni$ $E^0 = -0.23$ V

What is the maximum available energy to be obtained from the cell?

1. 191 kJ **correct**

2. 31.8 kJ

3. 95.5 kJ

4. 63.7 kJ

5. 159.2 kJ

Explanation:

ChemPrin3e T12 46
20:09, basic, multiple choice, < 1 min, fixed.
002

The standard voltage of the cell

$$Ag(s) \mid AgBr(s) \mid Br^-(aq) \mid\mid Ag^+(aq) \mid Ag(s)$$

is +0.73 V at 25°C.

Calculate the equilibrium constant for the cell reaction.

1. 5.1×10^{14}

2. 2.2×10^{12} **correct**

3. 2.0×10^{-15}

4. 4.6×10^{-13}

5. 3.9×10^{-29}

Explanation:

Msci 04 1010
20:01, general, multiple choice, > 1 min, fixed.
003

Balance the net ionic equation

$$I^- + NO_2^- \rightarrow NO + I_2$$

(in acidic solution).

What is the sum of the coefficients? Use H^+ rather than H_3O^+ where appropriate.

1. 11

2. 13 **correct**

3. 15

4. 17

5. 19

Explanation:
The oxidation number of I changes from −1 to 0, so I is oxidized. The oxidation number of N changes from +3 to +2, so N is reduced. We set up oxidation and reduction half reactions:
Oxidation: $I^- \rightarrow I_2$
Reduction: $NO_2^- \rightarrow NO$
N atoms are balanced. We need two I^- ions to balance I:
Oxidation: $2\,I^- \rightarrow I_2$
In acidic solution we use H_2O and H^+ to balance O and H atoms, adding the H_2O to the side needing oxygen:
Reduction: $2\,H^+ + NO_2^- \rightarrow NO + H_2O$
Next, we balance the total charge by adding electrons. In the reduction reaction thus far there is a total charge of +1 on the left and 0 on the right. One electron is added to the left:
Oxidation: $2\,I^- \rightarrow I_2 + 2\,e^-$
Red: $1\,e^- + 2\,H^+ + NO_2^- \rightarrow NO + H_2O$
The number of electrons gained by N must equal the number of electrons lost by I. We multiply the reduction reaction by 2 to balance the electrons:
Oxidation: $2\,I^- \rightarrow I_2 + 2\,e^-$

Reduction: $2\,e^- + 4\,H^+ + 2\,NO_2^- \to 2\,NO + 2\,H_2O$

Adding the half-reactions gives the balanced equation

$$2\,I^- + 4\,H^+ + 2\,NO_2^- \to I_2 + 2\,NO + 2\,H_2O$$

Msci 21 1221

20:07, general, multiple choice, > 1 min, fixed.

004

Consider the half-reactions

$Cu^{2+} + 2\,e^- \to Cu$ $E^0 = 0.34$ V

$Hg_2^{2+} + 2\,e^- \to 2\,Hg$ $E^0 = 0.80$ V

$Pd^{2+} + 2\,e^- \to Pd$ $E^0 = 0.99$ V

$Au^{3+} + 3\,e^- \to Au$ $E^0 = 1.42$ V

Of the species listed the strongest reducing agent is

1. Cu **correct**

2. Au

3. Au^{3+}

4. Pd

5. Hg_2^{2+}

Explanation:

The reducing agents (the agents that lose electrons) are on the right hand side of the equation. As the E^0 of the reduction half-cell reaction decreases, the strength of the reducing agent increases.

Msci 21 1212

20:07, general, multiple choice, > 1 min, fixed.

005

Consider the following standard reduction potentials.

$Cu^{2+} + 2\,e^- \to Cu$ $E^0 = 0.337$ V

$Ag^+ + 1\,e^- \to Ag$ $E^0 = 0.7994$ V

$Au^+ + 1\,e^- \to Au$ $E^0 = 1.68$ V

Which of the following statements about oxidizing strengths of Group IB metal ions is true?

1. Cu^{2+} is a stronger oxidizing agent than Ag^+.

2. Cu^{2+} is a stronger oxidizing agent than Au^+.

3. Ag^+ is a stronger oxidizing agent than Au^+.

4. Nothing can be predicted about oxidizing strengths from the data given.

5. Ag^+ is a stronger oxidizing agent than Cu^{2+}. **correct**

Explanation:

Mlib 08 0031

20:05, general, multiple choice, > 1 min, fixed.

006

If 289,500 Coulombs is passed through a solution of lead(II) nitrate ($Pb(NO_3)_2$) how many moles of metallic lead will be produced?

1. 3

2. 2

3. 1.5 **correct**

4. 0.667

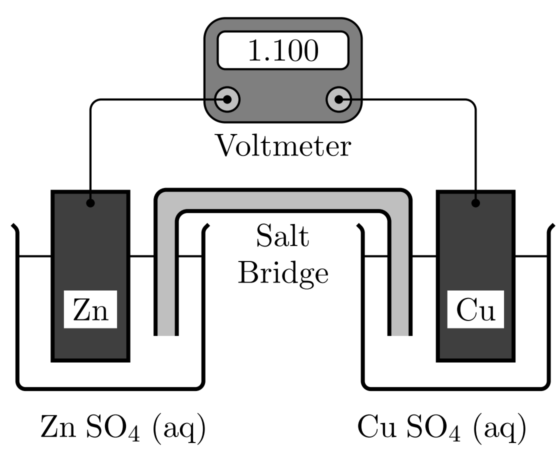
Explanation:

Mlib 08 0093

20:11, basic, multiple choice, > 1 min, fixed.

007

This diagram represents a simple battery (Daniell cell).



Which of the following is true?

1. The zinc electrode is positively charged.

2. The reaction occuring at the copper electrode is $Cu \rightarrow Cu^{2+} + 2e^-$.

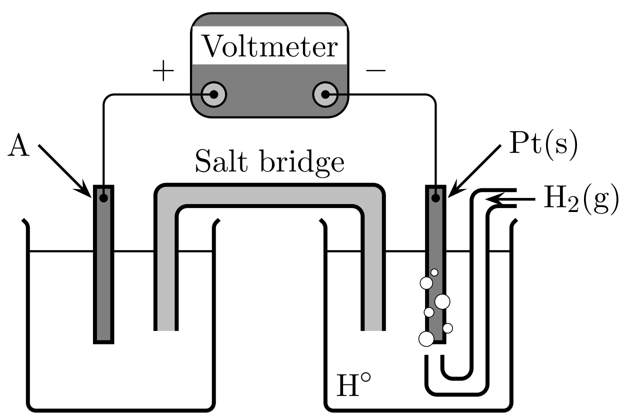
3. Oxidation is occuring at the zinc electrode. **correct**

4. The zinc electrode is eroded away and the Zn^{2+} ions move through the salt bridge and are deposited on the copper electrode.

Explanation:

ChemPrin3e T12 62
20:11, basic, multiple choice, < 1 min, fixed.
008

In the cell shown, A is a standard $Ag^+ \mid Ag$ electrode connected to a standard hydrogen electrode (SHE).



If the voltmeter reading is +0.80 V, what is the equation for the cell reaction?

1. $Ag(s) \rightarrow Ag^+(aq) + e^-$

2. $Ag^+(aq) + e^- \rightarrow Ag(s)$

3. $Ag(s) + H^+(aq) \rightarrow Ag^+(aq) + \frac{1}{2} H_2(g)$

4. $Ag^+(aq) + \frac{1}{2} H_2(g) \rightarrow Ag(s) + H^+(aq)$ **correct**

Explanation:

Msci 21 0901
20:06, general, multiple choice, > 1 min, fixed.
009

Consider the following statements:

Z1) In voltaic cells, the flow of electrons is spontaneous.

Z2) In voltaic cells, the electrons flow in the external circuit (through the wire) from the anode to the cathode.

Z3) In voltaic cells, the anode is the positive electrode.

Which of these statements is(are) true?

1. Z1 only

2. Z1 and Z3 only

3. Z2 and Z3 only

4. Z1, Z2 and Z3

5. Z1 and Z2 only **correct**

Explanation:

Msci 21 0908
20:07, general, multiple choice, > 1 min, fixed.
010

Consider the half-reactions

$Mn^{2+} + 2\,e^- \rightarrow Mn$	$E^0 = -1.029$ V
$Ga^{3+} + 3\,e^- \rightarrow Ga$	$E^0 = -0.560$ V
$Fe^{2+} + 2\,e^- \rightarrow Fe$	$E^0 = -0.409$ V
$Sn^{2+} + 2\,e^- \rightarrow Sn$	$E^0 = -0.136$ V

Using the redox couples to establish a voltaic cell, which reaction would be non-spontaneous?

1. $2\,Ga^{3+} + 3\,Fe \rightarrow 2\,Ga + 3\,Fe^{2+}$ **correct**

2. $Fe^{2+} + Mn \rightarrow Mn^{2+} + Fe$

3. $Sn^{2+} + Fe \rightarrow Sn + Fe^{2+}$

4. $2\,Ga + 3\,Sn^{2+} \rightarrow 2\,Ga^{3+} + 3\,Sn$

5. $Sn^{2+} + Mn \rightarrow Sn + Mn^{2+}$

Explanation:

Only $2\,Ga^{3+} + 3\,Fe \rightarrow 2\,Ga + 3\,Fe^{2+}$ has a negative E^0_{cell}, so it is the only reaction here that is nonspontaneous.

White 22
20:10, basic, multiple choice, $<$ 1 min, fixed.
011

Consider the cell

$$\text{In} \mid \text{In}^{3+}(1\text{ M}) \mid\mid \text{Ru}^{3+}(0.1\text{ M}) \mid \text{Ru}^{2+}(1\text{ M})$$

The cell voltage is

1. less than E^0. **correct**

2. greater than E^0.

3. the same as E^0.

4. Not enough information is given.

Explanation:

DAL 03 0408
20:07, general, multiple choice, $<$ 1 min, fixed.
012

Using the standard potential tables, what is the largest approximate E^0 value that can be achieved when two half cell reactions are combined to form a battery?

1. 6 V **correct**

2. 3 V

3. -3 V

4. -6 V

Explanation:

Msci 21 0911
20:08, general, multiple choice, $>$ 1 min, fixed.
013

Consider the voltaic cell
In | In^{3+} (1 M) ||
Ru^{3+} (1.0 M), Ru^{2+} (0.010 M) | C

$In^{3+} + 3\,e^- \rightarrow In \qquad E_0 = -0.34$ V
$Ru^{3+} + 1\,e^- \rightarrow Ru^{2+} \qquad E_0 = +0.25$ V

The experimental cell potential for the cell is approximately

1. $+0.11$ V.

2. $+0.59$ V.

3. $+0.71$ V. **correct**

4. $+0.30$ V.

5. $+0.26$ V.

Explanation:

Mlib 50 8052
20:11, general, multiple choice, $>$ 1 min, fixed.
014

The small button cells used in hearing aids and hand-calculators are being replaced by what kind of cells?

1. Ni-Cad

2. fuel

3. zinc-air **correct**

4. lead-acid

Explanation:

CIC T08 15
20:11, basic, multiple choice, $<$ 1 min, fixed.
015

Which type of widely used battery is NOT rechargeable?

1. alkaline **correct**

2. lithium-ion

3. lead-acid (storage batteries)

4. nickel-cadmium (NiCad)

Explanation:

ChemPrin3e T13 06
16:02, general, multiple choice, $<$ 1 min, fixed.
016

Consider the reaction

$$2\,NO_2(g) + F_2(g) \rightarrow 2\,NO_2F(g)$$

$$\text{rate} = -\frac{\Delta[\mathrm{F_2}]}{\Delta t}.$$

What is another form of the rate of the reaction?

1. $-\dfrac{2\,\Delta[\mathrm{NO_2}]}{\Delta t}$

2. $\dfrac{\Delta[\mathrm{NO_2F}]}{\Delta t}$

3. $\dfrac{\Delta[\mathrm{NO_2}]}{2\,\Delta t}$

4. $-\dfrac{\Delta[\mathrm{NO_2}]}{\Delta t}$

5. $\dfrac{\Delta[\mathrm{NO_2F}]}{2\,\Delta t}$ **correct**

Explanation:

Msci 16 0309

16:02, general, multiple choice, > 1 min, fixed.

017

If the rate of a reaction is Rate $= k\,[\mathrm{A}]^3$, then appropriate units for the rate constant k are

1. sec^{-1}

2. $\mathrm{mol}\cdot\ \mathrm{liter}^{-1}\cdot\mathrm{sec}^{-1}$

3. $\mathrm{liter}\cdot\ \mathrm{mol}^{-1}\cdot\mathrm{sec}^{-1}$

4. $\mathrm{mol}^2\cdot\mathrm{liter}^{-2}\cdot\mathrm{sec}^{-1}$

5. $\mathrm{liter}^2\cdot\mathrm{mol}^{-2}\cdot\mathrm{sec}^{-1}$ **correct**

6. $\mathrm{mol}^3\cdot\mathrm{liter}^{-3}\cdot\mathrm{sec}^{-1}$

7. $\mathrm{liter}^3\cdot\mathrm{mol}^{-3}\cdot\mathrm{sec}^{-1}$

Explanation:

$$\text{Rate} = k\,[\mathrm{A}]^3$$

$$\frac{\text{mol/liter}}{\text{sec}} = k\left(\frac{\text{mol}}{\text{liter}}\right)^3$$

$$\frac{\text{mol}}{\text{liter}\cdot\text{sec}} = k\left(\frac{\text{mol}^3}{\text{liter}^3}\right)$$

$$k = \frac{\text{mol}}{\text{liter}\cdot\text{sec}}\left(\frac{\text{liter}^3}{\text{mol}^3}\right) = \frac{\text{liter}^2}{\text{mol}^2\cdot\text{sec}}$$

Msci 16 0324b

16:02, general, multiple choice, < 1 min, fixed.

018

Three separate experiments were performed on the rate of the reaction

$$3\ \mathrm{A_2} + 2\ \mathrm{B} \rightarrow 2\ \mathrm{A_3B}.$$

The measured initial concentrations of $\mathrm{A_2}$ (in moles per liter) are shown below along with the measured initial rates of formation of $\mathrm{A_3B}$ (moles per liter per second).

Trial	Initial $[\mathrm{A_2}]_0$ M	Initial $[\mathrm{B}]_0$ M	Initial rate M/s
1	1.2	2.4	8.0×10^{-8}
2	1.2	1.2	4.0×10^{-8}
3	1.8	2.4	1.8×10^{-7}

What is the order of the reaction?

1. first order in $[\mathrm{A_2}]$ and first order in [B]

2. second order in $[\mathrm{A_2}]$ and first order in [B] **correct**

3. first order in $[\mathrm{A_2}]$ and second order in [B]

4. third order in $[\mathrm{A_2}]$ and second order in [B]

5. None of these is correct.

Explanation:

Rate $= k\,[A_2]^x[B]^y$

$$\frac{\text{Rate}_3}{\text{Rate}_1} = \frac{k\,[A_2]_3^x\,[B]_3^y}{k\,[A_2]_1^x\,[B]_1^y}$$
$$\frac{1.8\times10^{-7}}{8.0\times10^{-8}} = \left(\frac{1.8}{1.2}\right)^x\left(\frac{2.4}{2.4}\right)^y$$
$$2.25 = 1.5^x$$
$$\ln 2.25 = x\ln 1.5$$
$$x = \frac{\ln 2.25}{\ln 1.5} = 2$$

$$\frac{\text{Rate}_1}{\text{Rate}_2} = \frac{k\,[A_2]_1^2\,[B]_1^y}{k\,[A_2]_2^2\,[B]_2^y}$$
$$\frac{8.0\times10^{-8}}{4.0\times10^{-8}} = \left(\frac{1.2}{1.2}\right)^2\left(\frac{2.4}{1.2}\right)^y$$
$$2^1 = 2^y$$
$$y = 1$$

ChemPrin3e T13 33

16:03, basic, multiple choice, < 1 min, fixed.

019

Technetium-99m, used to image the heart and brain, has a half-life of 6.00 h.

What fraction of technetium-99m remains in the body after 1 day?

1. 0.0625 **correct**

2. 0.250

3. 0.0313

4. 0.125

Explanation:

ChemPrin3e T13 24

16:03, basic, multiple choice, < 1 min, fixed.

020

For a first-order reaction, after 2.00 min, 20% of the reactants remain.

Calculate the rate constant for the reaction.

1. 0.0134 s^{-1} **correct**

2. 0.000808 s^{-1}

3. 74.6 s^{-1}

4. 0.00582 s^{-1}

5. 0.00186 s^{-1}

Explanation:

Msci 16 0410 2nd order

16:03, general, multiple choice, > 1 min, fixed.

021

Consider the following reaction and its rate constant.

$$\text{A} \rightarrow \text{B} \quad k = 0.103\ \text{M}^{-1}\cdot\text{min}^{-1}$$

What will be the concentration of A after 1 hour if the reaction started with a concentration of 0.400 M ?

1. 0.115 M **correct**

2. 0.384 M

3. 8.28×10^{-4} M

4. 0.152 M

5. 0.236 M

6. 0.0843 M

7. 0.308 M

8. 0.361 M

Explanation:

$$\frac{1}{[A]_t} - \frac{1}{[A]_0} = a\,k\,t$$
$$\frac{1}{[A]_t} = \frac{1}{[A]_0} + a\,k\,t$$
$$= \frac{1}{0.400} + (0.103\,\text{M}^{-1}\cdot\text{min}^{-1})\,(60\,\text{min})$$
$$= 8.68$$
$$[A]_t = 0.115\,\text{M}$$

Msci 16 0601

16:03, general, multiple choice, > 1 min, fixed.

022

For the second-order reaction

$$2\,\mathrm{A} \rightarrow \text{products}$$

the reciprocal of the concentration of A remaining is plotted as a function of time.

What is the slope of the resulting line?

1. $2\,k$ **correct**

2. $2\,k\,t$

3. $-2\,k$

4. k

5. $-k\,t$

Explanation:

This question uses the straight line plot for the integrated rate law for a second order reaction. The equation for this is

$$\frac{1}{[\mathrm{A}]} = a\,k\,t + \frac{1}{[\mathrm{A}]_0}$$

The slope of this line is $a\,k$ since the reaction is plotted as a function of time, and since the coefficient of the reactant A is 2, the slope is $2\,k$.

Mlib 05 7027

16:05, general, multiple choice, > 1 min, fixed.

023

Based on the molecular model of chemical reactions discussed in class, which of the following is not required for a reaction to occur?

1. A collision between the molecules which appear in the net chemical equation. **correct**

2. A certain minimum amount of energy.

3. The proper orientation between reacting species.

4. A collision between the species involved in the mechanism.

Explanation:

Msci 16 1016

16:05, general, multiple choice, > 1 min, fixed.

024

For a given single step reaction the activation energy for the forward reaction is 40 kJ/mol rxn and the thermodynamic $\Delta E = -60$ kJ/mol rxn.

What is the activation energy for the REVERSE reaction?

1. $E_\mathrm{a} = 40$ kJ/mol rxn

2. $E_\mathrm{a} = 60$ kJ/mol rxn

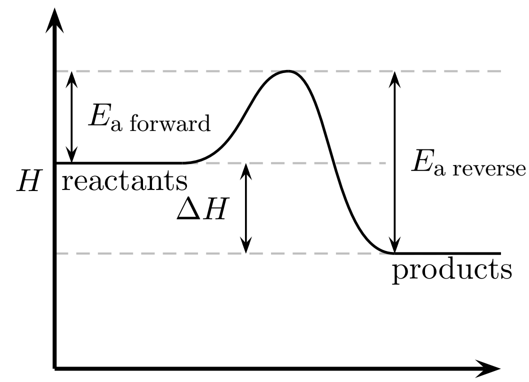
3. $E_\mathrm{a} = 20$ kJ/mol rxn

4. $E_\mathrm{a} = 100$ kJ/mol rxn **correct**

5. $E_\mathrm{a} = 0$ kJ/mol rxn

Explanation:

$\Delta H = -60$ kJ/mol, so this is an exothermic reaction:



E_a for the forward reaction = 40 kJ/mol, so E_a for the reverse reaction = 100 kJ/mol.

White 9

16:07, general, multiple choice, < 1 min, fixed.

025

The rate constant for a reaction is 1.50×10^{-8} s^{-1} at 0°C and has an activation energy of 45 $\mathrm{kJ \cdot mol^{-1}}$.

What is the predicted rate constant at 200°C?

1. 6.7×10^{-5} s^{-1} **correct**

2. 3.1×10^{-6} s^{-1}

3. 1.51×10^{-8} s^{-1}

4. 68.4 s^{-1}

5. 7.4×10^{-11} s^{-1}

Explanation:

Msci 16 0908x

16:06, general, multiple choice, > 1 min, fixed.

026

Consider the multistep reaction that has the overall reaction

$$2\,A + 2\,B \rightarrow C + D.$$

What is the rate law expression that would correspond to the following proposed mechanism?

$$\begin{array}{ll} A + B \rightleftharpoons I & \text{(fast)} \\ I + B \rightarrow C + X & \text{(slow)} \\ X + A \rightarrow D & \text{(fast)} \end{array}$$

1. Rate $= k\,[A]^2\,[B]$

2. Rate $= k\,[I]\,[B]$

3. Rate $= k\,[A]^2$

4. Rate $= k\,[A]\,[I]\,[B]$

5. Rate $= k\,[A]$

6. Rate $= k\,[A]\,[B]$

7. Rate $= k\,[A]\,[B]^2$ **correct**

8. Rate $= k\,[A]^2\,[B]^2$

9. Rate $= k\,[B]$

Explanation:

The slowest step is the rate determining step and is used to write the rate law.

$$\text{Rate} = k'\,[I]\,[B]$$

The rate law must be written in terms of concentrations of reactants and products only, so concentrations of intermediates cannot be included and a substitute must be found for [I]. The step that immediately precedes this slow step can be treated as an equilibrium system where

$$\text{Rate}_{\text{forward}} = k_f\,[A]\,[B] = k_r\,[I] = \text{Rate}_{\text{reverse}}$$
$$[I] = \frac{k_f}{k_r}\,[A]\,[B]$$

This can be substituted to give the equation

$$\text{Rate} = \frac{k'\,k_f}{k_r}\,[A]\,[B]^2 = k\,[A]\,[B]^2$$

ChemPrin3e T13 66

16:06, basic, multiple choice, < 1 min, fixed.

027

The reaction between nitrogen dioxide and carbon monoxide is thought to occur by the following mechanism:

$2\,NO_2(g) \rightarrow NO_3(g) + NO(g)$ $\quad k_1$, slow

$NO_3(g) + CO(g) \rightarrow NO_2(g) + CO_2(g)$ $\quad k_2$, fast

What is the rate law for this mechanism?

1. rate $= k_1\,k_2\,[NO_2]^2\,[CO]$

2. rate $= \dfrac{k_1}{k_2}\,[NO_2]^2\,[CO]$

3. rate $= k_1\,[NO_3]\,[NO]$

4. rate $= k_2\,[NO_3]\,[CO]$

5. rate $= k_1\,[NO_2]^2$ **correct**

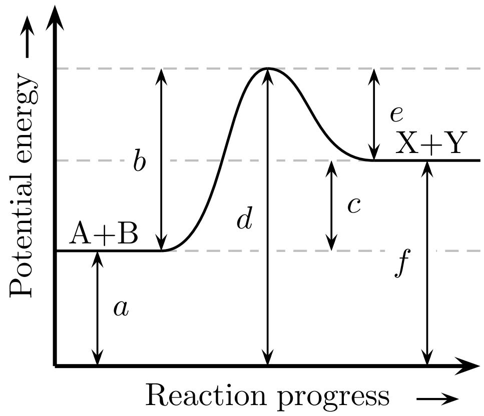
Explanation:

SPARKS Energy 08

16:05, basic, multiple choice, > 1 min, fixed.

028

Consider the following potential energy diagram.



If a catalyst were added, the height of which arrow would change? How would it change?

1. a; the activation energy would be lower.

2. b; the activation energy would be lower. **correct**

3. c; the activation energy would be higher.

4. a; the potential energy of the reactants would be higher.

5. f; the potential energy of the products would be lower.

Explanation:

DAL Ozone Destr

31:02, general, multiple choice, < 1 min, .

029

Which of the following is a catalyst that has contributed to the destruction of the ozone layer?

1. Cl• **correct**

2. CF_3Cl

3. Cl^-

4. O_3

5. O•

Explanation:

CIC catalyst biochemical

16:08, basic, multiple choice, < 1 min, fixed.

030

Biochemical reactions are most often catalyzed by

1. enzymes **correct**

2. NSAIDs

3. monomers

4. isomers

5. heat energy

6. prostaglandins

Explanation: