

Physical Properties

- 1) He < Ne < Ar
- 2) He < H < Li
- 3) Ne < F⁻ < O²⁻
- 4) Ca²⁺ < K⁺ < Ar

Thermodynamics

$$\Delta G = \underline{-166.527} \text{ kJ}$$

Is the reaction spontaneous in the forward direction? **YES** / NO

Electrochemistry

Oxidizing Agent = OZONE

Reducing Agent = RUBBER

Physical Properties

- 1) (yes/no) / (polar/nonpolar/ionic) / (large difference/small difference/no difference)
- 2) (yes/no) / (polar/nonpolar/ionic) / (large difference/small difference/no difference)
- 3) (yes/no) / (polar/nonpolar/ionic) / (large difference/small difference/no difference)
- 4) (yes/no) / (polar/nonpolar/ionic) / (large difference/small difference/no difference)
- 5) (yes/no) / (polar/nonpolar/ionic) / (large difference/small difference/no difference)

Acid/Base

- 1) (Acidic) / (Basic) / (Neutral)
Conjugate Acid/Base CH₃COOH
- 2) (Acidic) / (Basic) / (Neutral)
Conjugate Acid/Base NH₃
- 3) (Acidic) / (Basic) / (Neutral)
Conjugate Acid/Base HClO

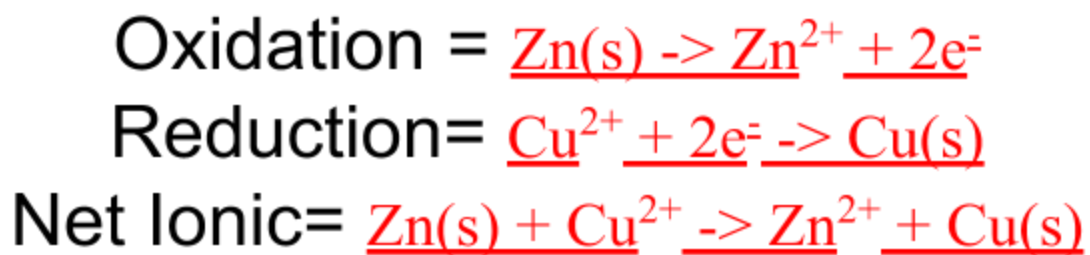
Kinetics

$$\text{Rate} = \underline{k[A]^2}$$

Thermodynamics

$$\Delta H = \underline{-890.36} \text{ kJ/mol}$$

Electrochemistry



Acid/Base

$$\underline{10.0} \text{ g}$$

Physical Properties

5.97 L

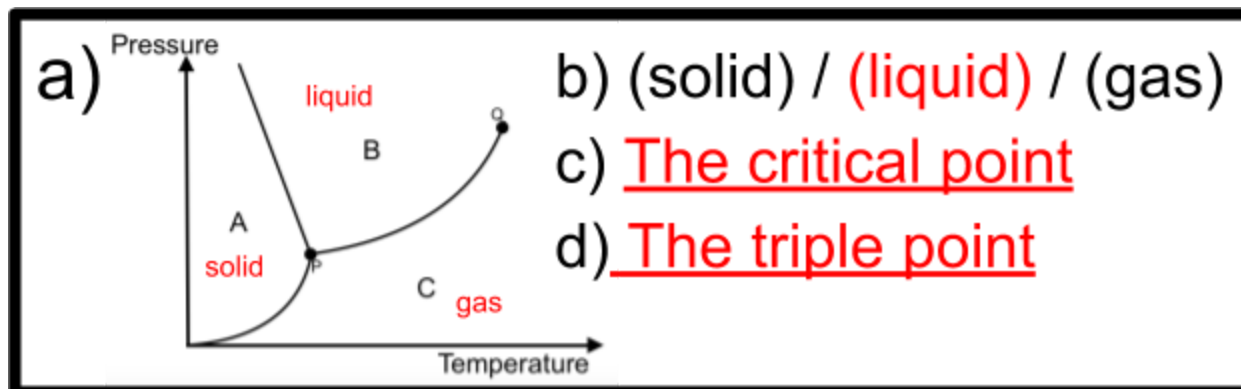
Thermodynamics

382 kJ

Kinetics

(A) / (B) / (C) / (D)

Physical Properties



Equilibrium

- 1) Increase / Decrease / No Effect
- 2) Increase / Decrease / No Effect
- 3) Increase / Decrease / No Effect
- 4) Increase / Decrease / No Effect
- 5) Increase / Decrease / No Effect
- 6) Increase / Decrease / No Effect

Electrochemistry

0.46 Volts

Physical Properties

3 moles

Thermodynamics

List 1 = (A) / (B) / (C) / (D)

List 2 = (A) / (B) / (C) / (D) / (E) / (F) / (G) / (H) / (I) / (J)

Equilibrium

$\Delta G = \underline{-403}$ kJ

Acid/Base

$$\text{pK}_a = \underline{6.0}$$

Physical Properties



Thermodynamics

$$\underline{1.08 \times 10^{-4}} \text{ moles}$$

Physical Properties

Temp = 428 K

Acid/Base

List 1 = (A) / (B) / (C) / (D)

List 2 = (A) / (B) / (C) / (D) / (E) / (F) / (G) / (H) / (I) / (J)

Kinetics

13500 years

Physical Properties

2.62 Columbs

Thermodynamics

$$K_{\text{eq}}(100 \text{ K}) = \underline{1.0885 * 10^{-23}}$$

$$K_{\text{eq}}(1000\text{K}) = \underline{0.00505}$$

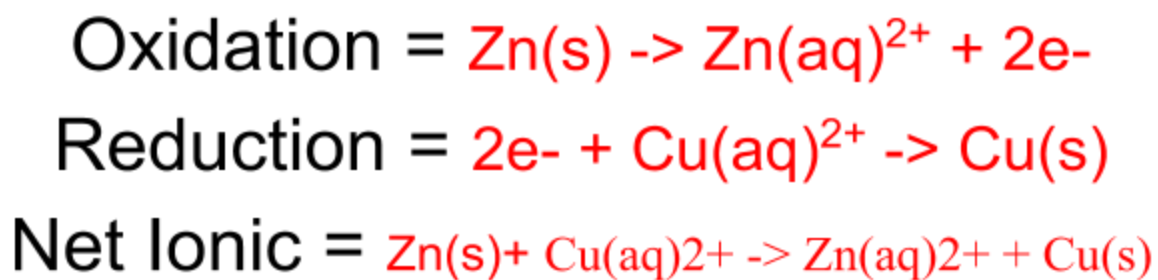
Electrochemistry

$$E^{\circ} = \underline{1.086} \text{ V}$$

Equilibrium

8.641 grams

Chemical Reactions



Acid/Base

- 1) 0 4) 0
2) 0 5) +1
3) 0

Physical Properties

885.41 grams

Chemical Reactions

69.75 % (mass/volume)

Kinetics

B < C < A

Physical Properties

Copper = 0.052 moles
Steel = 0.026 moles

Thermodynamics

1060.4 joules

Equilibrium

55 mL

Physical Properties

Lower Vapor Pressure = C_6H_6
Weaker Intermolecular Force = CCl_4

Thermodynamics

$$T_F = \underline{350} \text{ K}$$

Kinetics

Thermodynamic Product: (A) / (B)
Kinetic Product: (A) / (B)

Kinetics

Reason 1 = (less) / (more) / (equal)
Reason 2 = (catalyzed) / (uncatalyzed)
Reason 3 = (less) / (more) / (equal)
Reason 4 = (less) / (more) / (equal)
Therefore... = (faster than) / (slower than) / (at the same rate as) ...
(Reason 1) / (Reason 2) / (Reason 3) / (Reason 4)

Physical Properties

$$[\text{Air}] = \underline{6.22} \text{ M}$$

Acid/Base

$$\underline{Y} < \underline{X} < \underline{Z}$$

Physical Properties

0.18 M

Electrochemistry

$$[E_{\text{cell}}] = \underline{-1.23} \text{ V}$$

Kinetics

Reason 1 = (less) / (more) / (equal)

Reason 2 = (catalyzed) / (uncatalyzed)

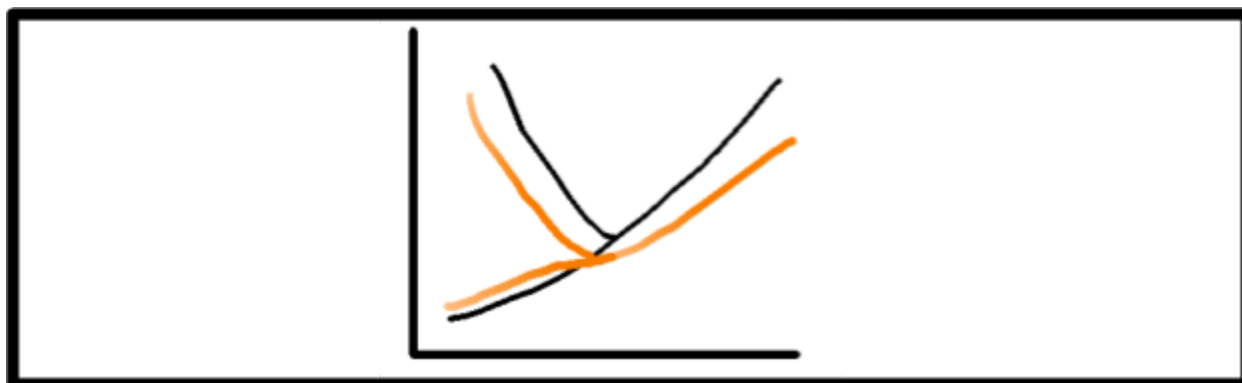
Reason 3 = (less) / (more) / (equal)

Reason 4 = (less) / (more) / (equal)

Therefore... = (faster than) / (slower than) / (at the same rate as) ...

(Reason 1) / (Reason 2) / (Reason 3) / (Reason 4)

Physical Properties



Chemical Reactions

14.31 g

Kinetics

Order of X: 2
Order of H₂: 0

Physical Properties

- 1) sp
- 2) sp^2
- 3) sp^2
- 4) sp
- 5) sp^3

Chemical Reactions

224.0 L

Kinetics

1.785 times faster

Physical Properties

- | | |
|--------------------------|---------------------|
| 1) Bent | 4) tetrahedral |
| 2) Trigonal
bipyramid | 5) linear |
| 3) linear | 6) bent |
| | 7) trigonal pyramid |

Chemical Reactions

- a) 1.25 moles
b) 0.455 moles
c) 0.0801 moles

Kinetics

$$\text{Rate} = 1.2 \times 10^{-2} \times [\text{Y}][\text{S}]^2$$

Physical Properties

~~(A)~~ / (B) / ~~(C)~~

Chemical Reactions

4.5 M

Acid/Base

pH = 1.52

Physical Properties

Inaccuracy = Circle both "a" and "c"
Imprecision = Circle both "b" and "d"

Chemical Reactions

7800.33 g

Acid/Base

I = 1.79 amps