

# FALL 2020 FINAL EXAM REVIEW

## Comprehensive Review Material (about 40% of the final)

Numbers refer to problems from the current text.

Exam and quizzes numbers from those particular quizzes or exams.

Throughout the semester I've made comments about each of the exams.

It is worth your time to review these.

### Periodicity, electron configurations

Examples 1.12, 1.18, 2.32, 2.27, 2.28, 2.31

Defining equations for IE and EA Qz1#6, Ex1#8

Excited vs ground state electron configurations Qz1#3, Ex1#4, Qz5#5, Ex3#4

Magnetism: para- vs dia- vs ferromagnetism

Orbital size, atom size Ex1#3, Qz1#4

### Solids and common cubic packing arrangements

P, I, F packing patterns, 3 common cubic lattices

common holes: location and number Ex2#3

cesium chloride, rock salt, zinc blende ionic lattices

Ionic properties Qz3#2

### Thermodynamics

Haber cycles Qz3#3, Ex2#4

standard energy of formation (meaning of little "f"  $\Delta\{G \text{ or } H\}_f^\circ$ ) Text 6.4, 6.6 Ex1#11c

K meaning and usage Qz2#2, Ex2#11, 12

other thermo applications Text 6.13, 18, 22, 34 Qz2#1, #3 Ex3#5, #6

Decomposition of polyatomic ion salts Qz4#3, Ex2#6a, #13-15

### Redox

pH dependence

oxidation numbers, balancing half reactions

$n$  in balanced redox reactions

components of batteries and fuel cells Ex1#10, Ex2#8

electrolysis

electrolysis of water

reactive metals vs their metal ions

### Hydridic/protic Hydrogen atoms

for example 15.25

### Molecular orbital diagrams and chemistry they predict/explain

for example 3.3, 3.5, 3.6 Ex1#5-7, Ex1#14-16, Ex3#10

### $M^{n+}(\text{aq})$ acid base chemistry

for example contrast Fig 13.17 with behavior of  $B(OH)_3$  Qz5#2, 3

Al, Si, P structures common in nature

14.56, 14.45 See also p 344

Qz7#2-5, Ex3#8,9

Lewis dot/VSEPR 3.11, 3.12

Intermolecular forces 3.31 – 32

Lewis Acid/base

Text 14.49, 7.33, 15.43

Ex3#2,3

**New Material (about 60% of the final)**

as from lecture, assigned reading, and practice homework

Oxygen family Ch 16

Halogen family Ch 17

Transition metal chemistry Ch 19