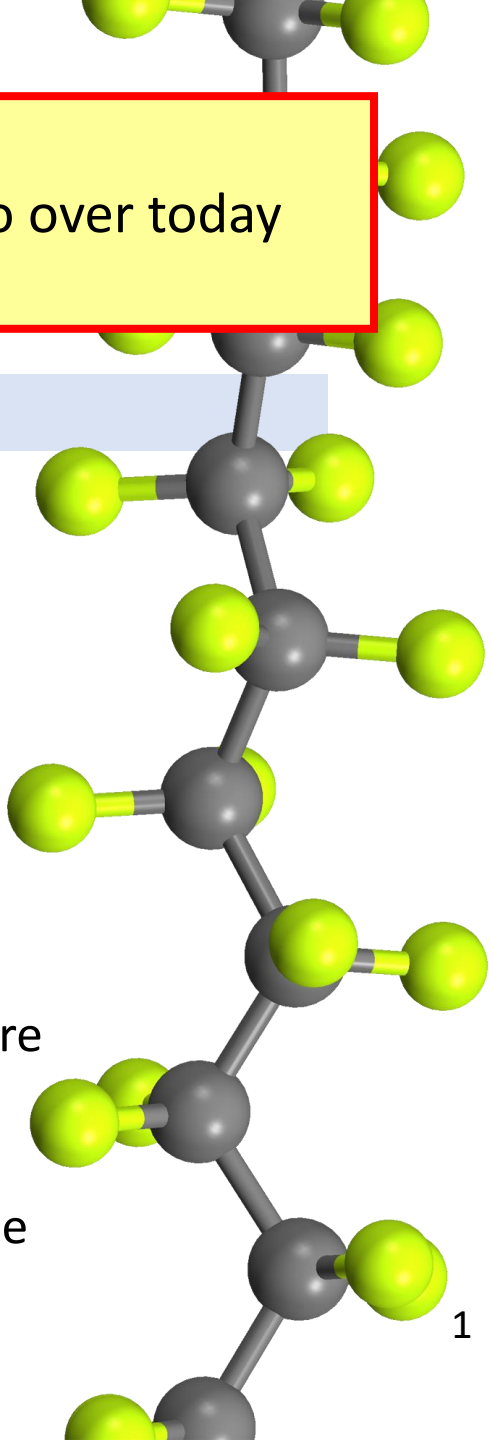
Welcome to our CHEM 4 review session

Go to LearningCatalytics.com to vote on which questions you want me to go over today

Session ID = 71589311

Exam #3: Information

- ✓ **Exam #3 is Friday, December 4.**
  - ✓ During normal class period. Go to Canvas to take the exam.
  - ✓ Timed: 50 minutes
  - ✓ 20 multiple choice questions; worth 5 pts each.
  - ✓ Both questions and answers will be randomized for each student.
  - ✓ Can use class handouts, textbook, lecture notes, PowerPoint slides.
  - ✓ Get all your materials (such as handouts, calculator and paper/pencil) ready before you start the exam.
  - ✓ Even though it is open book, you will not have enough time to look up every single thing, so you must study and be fully prepared going into the exam.



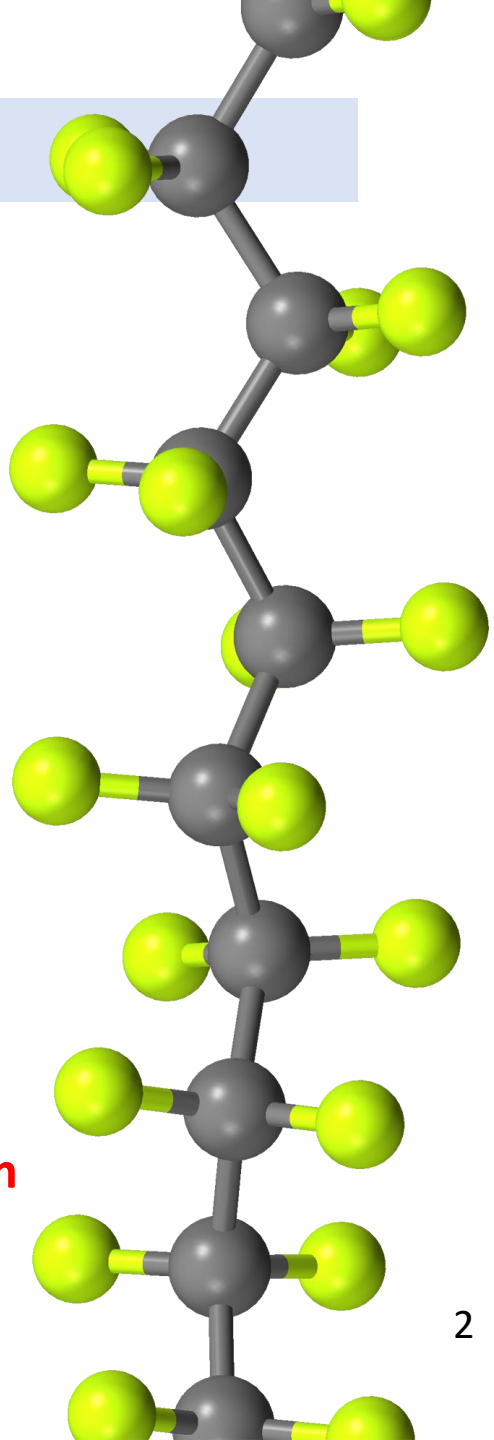
Exam #3: Resources

October calendar: tinyurl.com/SacStateChem4

- ✓ Learning Outcomes for Exam #3.
- ✓ PowerPoint slides and recordings of lecture.
- ✓ Practice exams, 4 versions: A, B, C, and D. [NOTE: they are not on Canvas]
  - ✓ Time yourself; take it like a real exam.
  - ✓ Make a list of the type of questions you are getting wrong and focus your study on those topics.
  - ✓ For extra practice on those topics: Video recording of lecture, PowerPoint slides, e-text, optional homework problems, PAL worksheets.
- ✓ Finish up any late homework for credit.

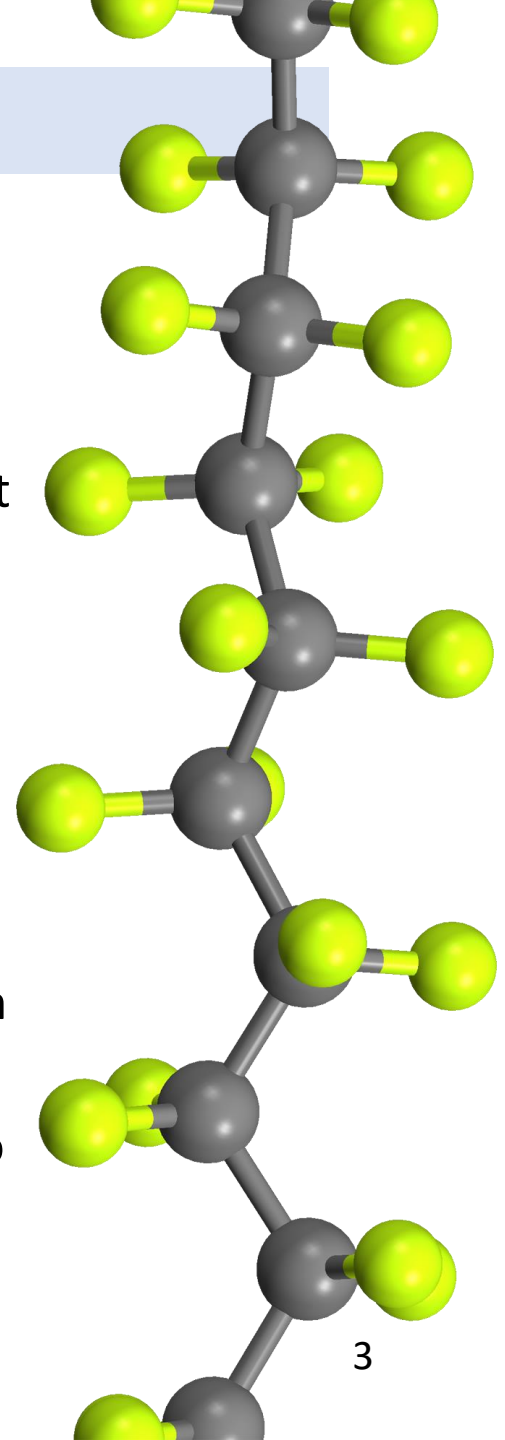
Need help?

- ✓ Jeff's office hours this week: **W 9 – 9:30 am and 11 – 11:30 am**.
- ✓ PAL office hours: link is on our CHEM 4 website
- ✓ PAL study hall (open to all CHEM 4 students): **Wednesday (12/2) 1-3 pm. Zoom Code: 829 9881 9465**



Academic dishonesty:

- ✓ Cannot use any online resources that are not explicitly associated with class.
- ✓ Students posting to sites like Chegg, Bartleby, or Study.com are cheating.
- ✓ **Remember:** Everyone get's hurt by cheating:
  - ✓ Cheaters are stealing the hard work of others by taking a grade that they haven't earned.
  - ✓ Cheaters hurt themselves because they won't be prepared for our next exam or for CHEM 1A/1E, not to mention the MCAT, EIT, DAT, PCAT.
  - ✓ Cheaters risk getting caught and being brought up on disciplinary charges.
  - ✓ SacState's reputation is hurt when employers realize our grads don't know anything!
- ✓ **Bottom line:** There is no reason to cheat in this class. You are smart enough to earn a good grade. So, do your studying and be proud of the grade that you earn.
- ✓ **My promise to you:** There will be no surprises and no trick questions. I just want to see if you have been learning the material that we've covered.



V.A, Q2

leave s, l, g, / together

weak acid, weak base

$2\,Na_3PO_4(aq) + 3\,FeCl_2(aq) \rightarrow 6\,NaCl(aq) + Fe_3(PO_4)_2(s)$

$6\,Na^{+1}(aq) + 2\,PO_4^{-3}(aq) + 3\,Fe^{+2}(aq) + 6\,Cl^-(aq) \rightarrow 6\,Na^+(aq) + 6\,Cl^-(aq) + Fe_3(PO_4)_2(s)$

VA, Q10

$\_\,K_3C_6H_5O_7 + \_\,3\,CO_2 + \_\,3\,H_2O \rightarrow$

$\_\,H_3C_6H_5O_7 + \_\,3\,KHCO_3$

X

X

3 H
3 C
9 O

VA Q#13

$3Zn(NO_3)_2(aq) + 2(NH_4)_3PO_4(aq) \rightarrow Zn_3(PO_4)_2(s) + 6NH_4NO_3(aq)$

$3Zn^{+2}(aq) + 6NO_3^-(aq) + 6NH_4^+(aq) + 2PO_4^{-3}(aq) \rightarrow$

C) $Zn_3(PO_4)_2(s) + 6NH_4^+(aq) + 6NO_3^-(aq)$

$6 \times NH_4^+$ $6 \times NO_3^-$

$Zn_3(PO_4)_2$

VA Q#16

Fe X (ore)

1.02×10^{24} Fe atoms

69.94 g Fe

$\frac{69.94 \text{ g Fe}}{100 \text{ g Ore}}$

Fe atoms → mole Fe → g Fe → g Ore

$$\left(1.02 \times 10^{24} \text{ Fe}\right)\left(\frac{1 \text{ mol Fe}}{6.02 \times 10^{23} \text{ Fe}}\right)\left(\frac{55.85 \text{ g Fe}}{1 \text{ mol Fe}}\right)\left(\frac{100 \text{ g Ore}}{69.94 \text{ g Fe}}\right)$$

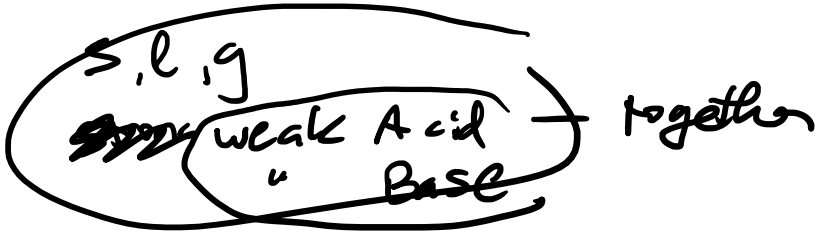
$$= 135.3 \text{ g}$$

VA Q#21

gas forming rxns → asym chromosomes etc.

1-3 Acid + carbonate/sulfide/sulfite

(4) base + ammonium
NaOH NH4Cl



VB Q3

✓ $2HF(aq) + Ba(OH)_2(aq) \rightarrow 2H_2O(l) + BaF_2(aq)$

✓ $3HF(aq) + \cancel{Ba^{+2}(aq)} + 3OH^-(aq) \rightarrow 2H_2O(l) + \cancel{Ba^{+2}(aq)} + 2F^-(aq)$

$HF(aq) + OH^-(aq) \rightarrow H_2O(l) + F^-(aq)$

YB Q13

0.55 g Sn^{+4}

g Sn^{+4} → mol Sn^{+4} → mol Na_2CO_3 → g Na_2CO_3

$$2\,Na_2CO_3(aq) + 1\,Sn^{+4}(aq) \rightarrow 4\,Na^+(aq) + Sn(CO_3)_2(s)$$

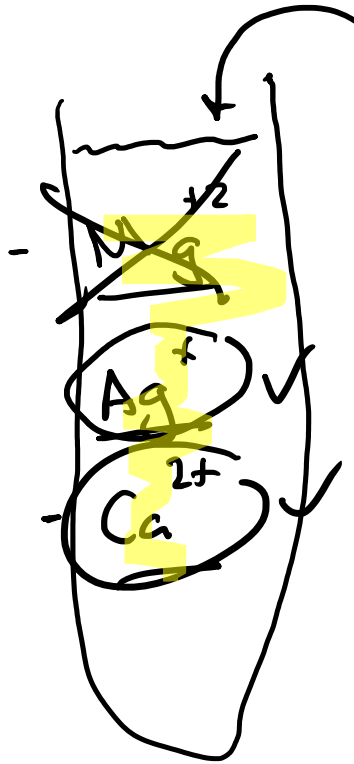
(+1, -2)

? g

$$(0.55\text{g } Sn^{+4})\left(\frac{1\text{ mol } Sn^{+4}}{118.7\text{ g } Sn^{+4}}\right)\left(\frac{2\text{ mol } Na_2CO_3}{1\text{ mol } Sn^{+4}}\right)\left(\frac{105.99\text{ g } Na_2CO_3}{1\text{ mol } Na_2CO_3}\right)$$

$$= 0.98\text{ g } Na_2CO_3$$

VB Q15



$K^+ + Br^- + Ag^+ \rightarrow AgBr(s)$ ✓

$2K^+ + SO_4^{2-} + Ca^{+2} \rightarrow CaSO_4(s)$ ✓

$3K^+ + PO_4^{3-} + Mg^{+2} \rightarrow Mg_3(PO_4)_2(s)$ ✗

VB Q19

$Sn(CO_3)_2$

? g

5.00×10^{23} O

O → mol O → mol $Sn(CO_3)_2$ → g $Sn(CO_3)_2$

$$\left(5.00 \times 10^{23}\ \text{O}\right)\left(\frac{1\ \text{mol O}}{6.02 \times 10^{23}\ \text{O}}\right)\left(\frac{1\ \text{mol } Sn(CO_3)_2}{6\ \text{mol O}}\right)\left(\frac{238.72\ \text{g } Sn(CO_3)_2}{1\ \text{mol } Sn(CO_3)_2}\right)$$

$$= 33.0\ \text{g } Sn(CO_3)_2$$