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 = 51578190

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.
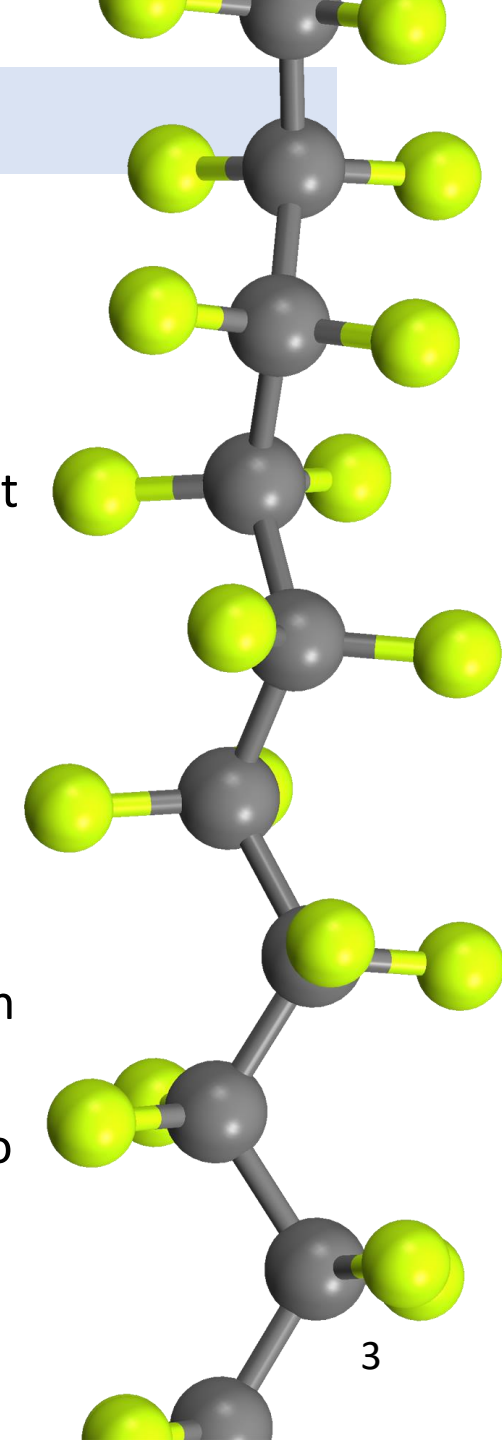- ✓ Finish up any late homework for credit.

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**
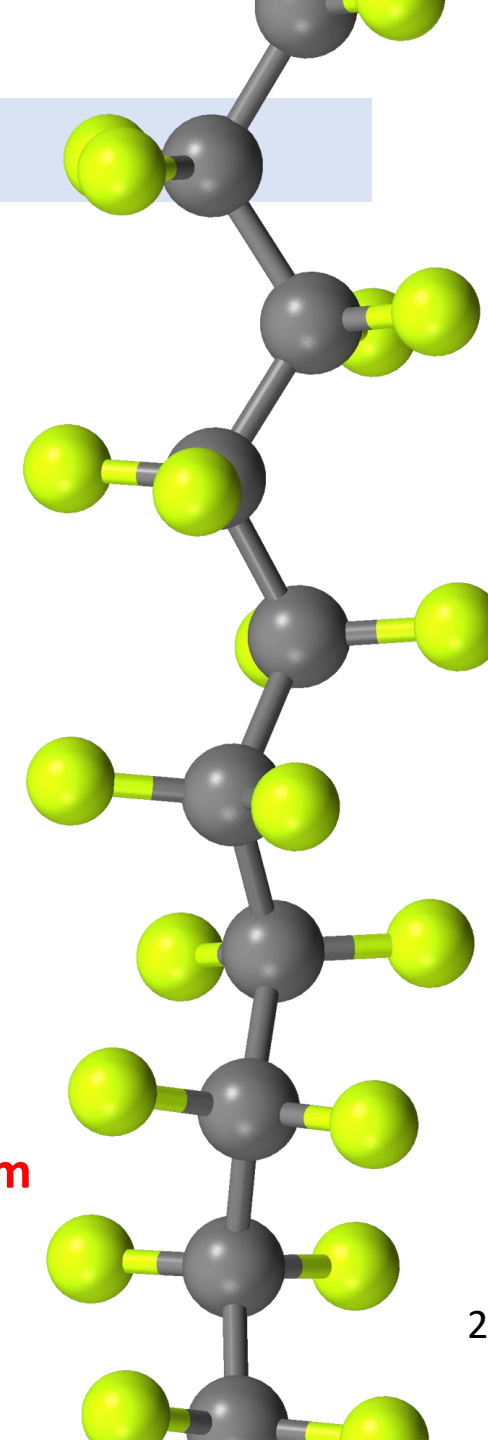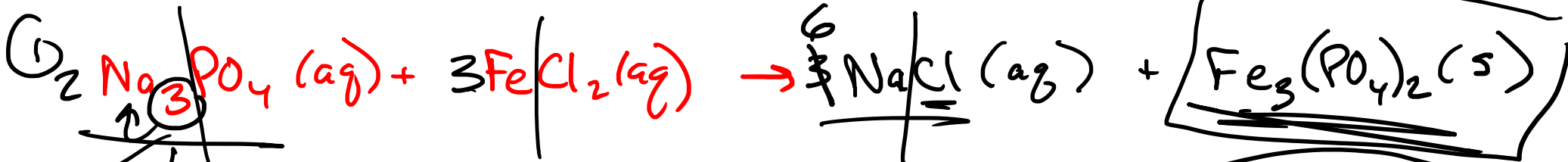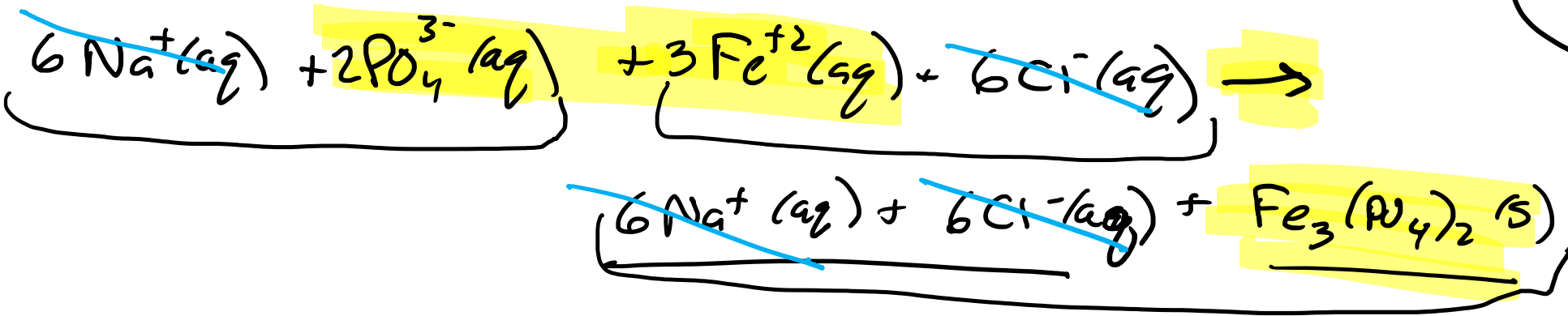
Academic dishonesty:

- ✓ 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.

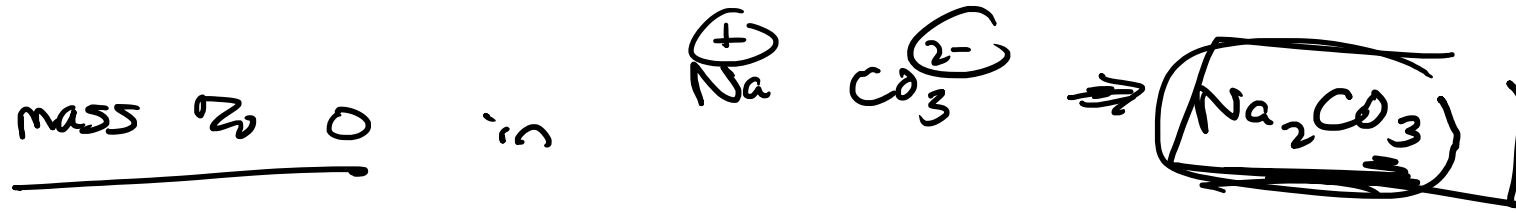(1) $2 Na_3 PO_4 (aq) + 3 FeCl_2 (aq) \rightarrow 6 NaCl (aq) + Fe_3(PO_4)_2 (s)$

③

if s, l, g
or weak acid
weak base

leave together

(2)

$6 Na^+ (aq) + 2 PO_4^{3-} (aq) + 3 Fe^{+2} (aq) + 6 Cl^- (aq) \rightarrow$

$6 Na^+ (aq) + 6 Cl^- (aq) + Fe_3 (PO_4)_2 (s)$
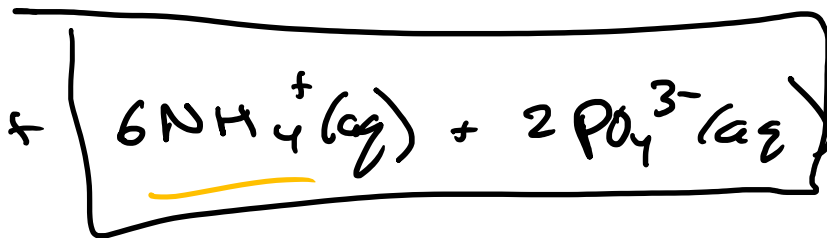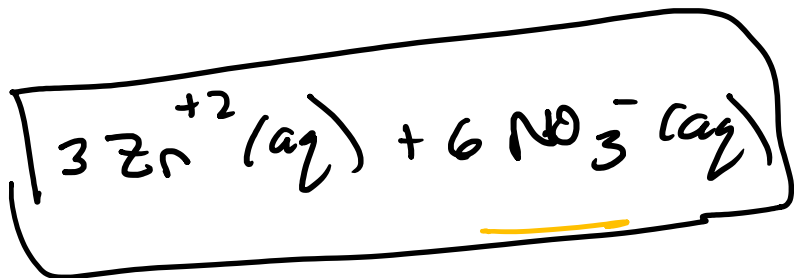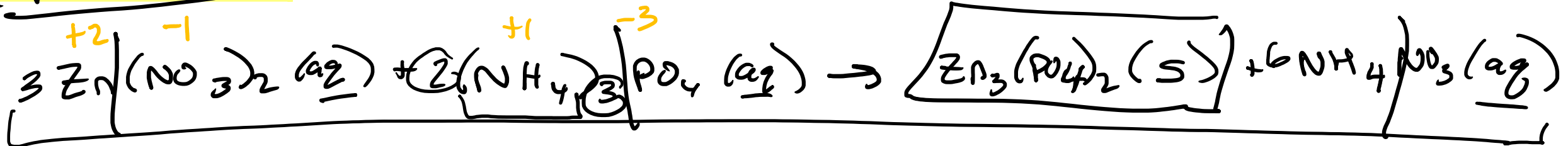
③

mass % O in Na^+ CO_3^{2-} $\Rightarrow$ Na_2CO_3

$$\frac{3(16.00)}{2(22.99) + 1(12.01) + 3(16.00)} \times 100\% = 45.29\%$$

$$3 \overset{+2}{Zn}(\overset{-1}{NO_3})_2 (aq) + 2 (\overset{+1}{NH_4})_3 \overset{-3}{PO_4} (aq) \rightarrow Zn_3(PO_4)_2 (s) + 6 NH_4 NO_3 (aq)$$

$$3 Zn^{+2} (aq) + 6 NO_3^- (aq) + 6 NH_4^+ (aq) + 2 PO_4^{3-} (aq) \rightarrow Zn_3(PO_4)_2 (s) + 6 NH_4^+ (aq) + 6 NO_3^- (aq)$$

$$6 \times NH_4^+$$

$$6 \times NO_3^-$$

$$Zn_3(PO_4)_2$$

$$C_9H_{20} + 14O_2 \longrightarrow \boxed{9}CO_2 + 10H_2O$$

18 + 10 = 28

$$2\,Al\,(s) + Fe_2O_3\,(aq) \rightarrow Al_2O_3\,(s) + Fe\,(l)$$

ox # →

0   +3   -2   +3   -2   0

lost $3e^-$ = ox.

gained $3e^-$ = red.

✗ A)   A + B → AB

B)   AB + C → A + CB

C)   AB + CD → AD + CB

D)   AB → A + B

7

W.A.

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

✓ $2HF (aq)$ + $Ba^{2+} (aq)$ + $2OH^- (aq)$ → $2H_2O (l)$ + $Ba^{+2} (aq)$ + $2F^- (aq)$

✓ $HF (aq)$ + $OH^- (aq)$ → $H_2O (l)$ + $F^- (aq)$

iron (II) | hydroxide

Fe^{+2} OH^{-} $\Rightarrow$ $Fe(OH)_2$
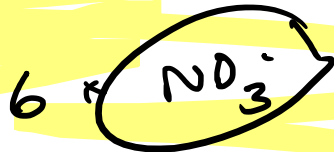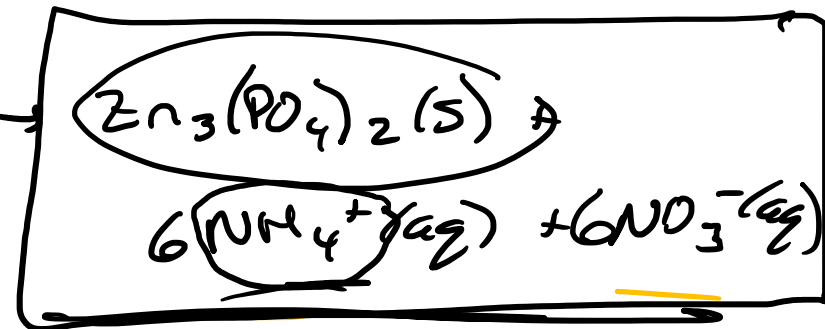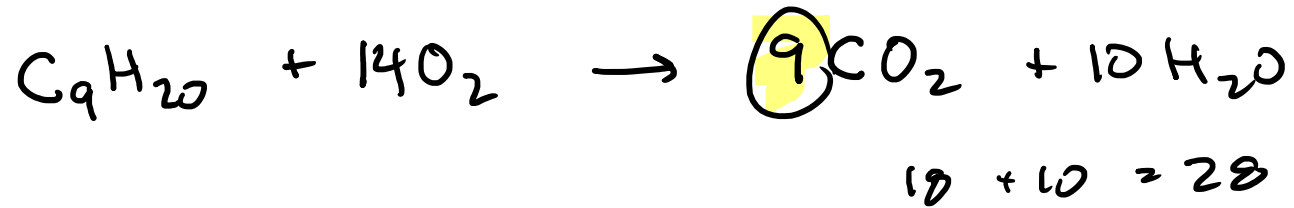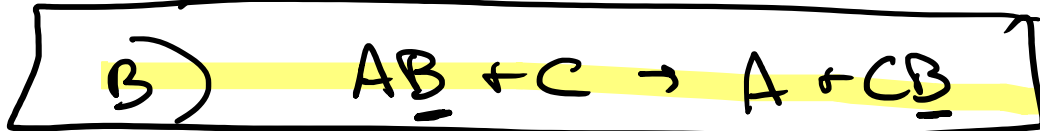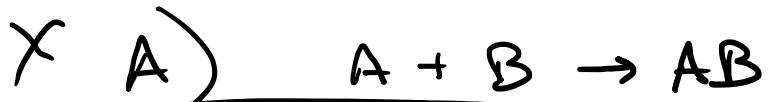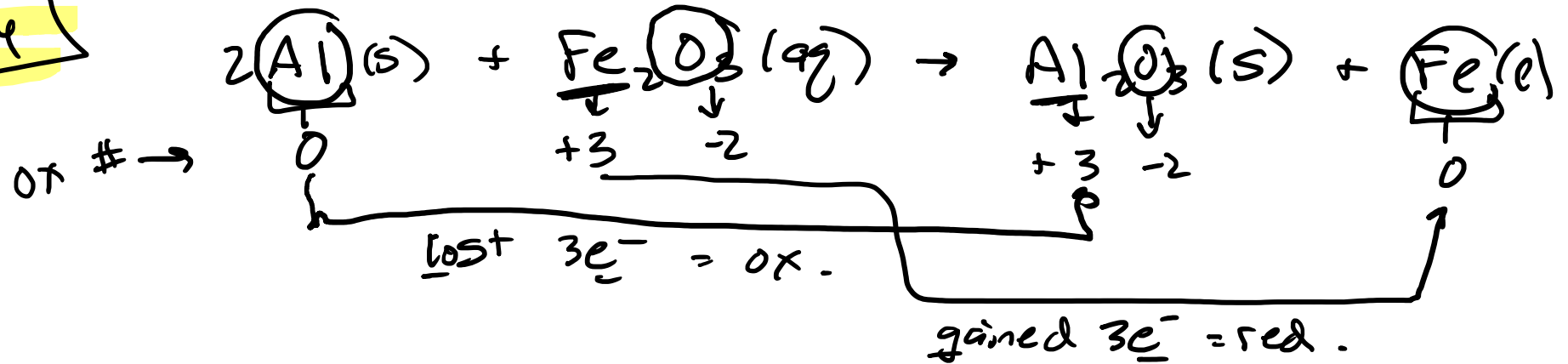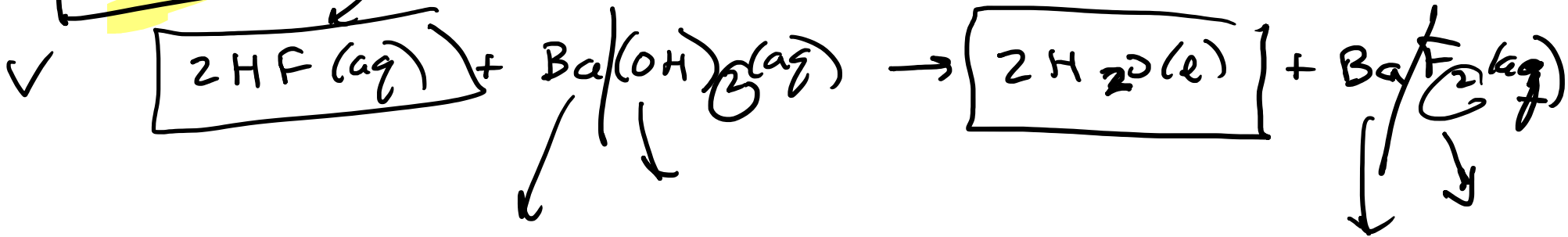
$$
\begin{array}{l}
55.85 \\
16.00 \\
16.00 \\
1.00 \\
1.00 \\
\hline
89.866
\end{array}
\rightarrow 89.87 \text{ g/mol}
$$

$$70.00 \text{ g} \quad C\left(\frac{1}{12.01}\right) = \frac{5.828}{1.665} \quad \boxed{3.500} \longrightarrow 7$$

$$3.36 \text{ g} \quad H\left(\frac{1}{1.008}\right) = \frac{3.33\overline{3}}{1.665} = 2.0 \xrightarrow{\textcircled{\times 2}} 4$$

$$26.64 \text{ g} \quad O\left(\frac{1}{16.00}\right) = \frac{1.665}{1.665} = 1.0 \longrightarrow 2$$

$$C_7 H_4 O_2 = 120.1 \text{ g/mol}$$

$$\frac{240 \text{ g/mol}}{120.1 \text{ g/mol}} = 1.998 \times 2 \longrightarrow C_{14}H_8O_4$$

.5

2

$$\frac{1}{4} \quad .25 \times 4$$
$$\frac{1}{5} \quad .20 \times 5$$
$$\frac{1}{3} \quad .33 \times 3$$
$$\frac{1}{2} \quad .50 \times 2$$

4.70 g P $\left(\dfrac{1}{30.97}\right)$ = 0.1518 / 0.1518 ⟩ 1 → 2

3.64 g O $\left(\dfrac{1}{16.02}\right)$ = 0.2275 / 0.1518 ⟩ 1.499 X) 2 → 3

8.34 g P_xO_y

P_2O_3

VB Q 15

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

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

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

Mg^{2+}

Ag^+

Ca^{2+}