Element Presentation Assignment

The purpose of this assignment is to learn a great deal about the descriptive chemistry of a specific group of elements and have the opportunity to learn a little more about some of the other groups by listening to presentations. A 6 – 10 page paper will be written that will serve as the basis of a class presentation. Your paper will review the current state of knowledge on group of elements, including all the following topics:

- History of their discovery; including human aspects
- Isolation and Properties of the Elements
- Binary Chemistry, including oxidation states
- Compounds and Their Uses
- Current Research, a brief description of a single recent paper relevant to the synthetic chemistry of one or more of the elements

The paper and presentation should contain the information you feel is the most interesting and useful, both to you and your classmates. It will not be comprehensive, but it should be thorough.

Guidelines for preparing your paper and presentation follow:

**Paper**

1. **Outline**

   In two weeks, you will turn in an outline of your paper.

   First, and foremost, your outline will contain a bibliography of all references in ACS format (see *The ACS Style Guide, a Manual for Authors and Editors*; Dodd, J. S., Ed.; American Chemical Society: Washington, DC, 1997).

   Your bibliography will consist of at least three books, several websites, and one current (within the last year) *Inorganic Chemistry* (ACS journal) article featuring at least one of your elements.

   **Books:** Any books used should substantially deal with the descriptive chemistry of all the elements, your group of elements or an individual element. General chemistry and most inorganic chemistry textbooks are not acceptable because they do not have descriptive chemistry as their focus. Consider the publication date and try to find recent publications. Older references contain some good information (particularly historical) and are worth looking at, but be aware of their limitations. The language may be archaic (valency, when oxidation state is the more correct term) and information about production, usage and toxicity may be outdated.

Web: Information found on a webpage is always suspect. Try to find independent verification from other sources. Consider the background and motivation of the author(s). Be especially careful of statements about uses of the elements. Look for references on the webpage and check them out.


Article: Find an article from 2015 or 2016 Inorganic Chemistry that features one (or more) of your elements in a way not seen in any of the other reference sources. It should be a largely synthetic paper. Do not use theoretical studies. This part of the course deals with descriptive chemistry. Make sure you understand the article thoroughly. This section in your paper will contain a summary of the article, with ChemDraw structures, in your own words, focusing on the contribution of your element(s).

The outline will be a typed, bullet topics outline that contains detailed information and has the organization of the final paper. It will contain the headings below and contain all the information that will be in your paper (without a lot of connecting words). Never write anything in your outline (or say anything in your talk) that you do not fully understand. Check additional references, check the web, but, primarily, ask me. I will give you feedback on your outline that will be acted on in your final paper.

I. Introduction
Identify a Group “theme”. What do they have in common? How do they differ? Set up the paper with a paragraph that addresses these questions and others.

II. History
Discovery: by whom (first and last name), when, what circumstances (chemistry).
Name origin: stories and explanations

III. Isolation and Properties of the Elements
Describe: do not repeat history – include chemistry. Do not focus on where they are found. Talk about the chemistry. Do not include all the details.

IV. Chemistry
Oxidation states in general. Do not just list. Identify the most stable oxidation state(s).
Example balanced reactions of the elements with other elements – identify patterns and oxidations states.
Example balanced reactions of the compounds. Do not repeat isolation of the elements (above).
radiochemistry?

V. Elements, Compounds and Their Uses
Explain why (chemistry) it is used and in what form. Make sure this is current.
VI. Current Research
A single specific article from recent (2014, 2015) Inorganic Chemistry on one or more of the elements in your group. Describe the article in your own words. Including any relevant chemistry talked about in your paper is especially important. Give structures.

VII. Conclusion
Revisit the introduction

Example Bibliography

1. Weeks, Mary Elvira Discovery of the Elements; Published by the Journal of Chemical Education, Easton, PA, 1968. Available online at the JCE website (jchemed.chem.wisc.edu/ search under “Mary Weeks”) (reference as a book.)


2. Paper
The paper will be 6 – 10, double-spaced pages, one side, size 12 Times New Roman font that contains all your research, put together according to your outline, and proof-read for spelling, punctuation and grammar (see below). Three weeks after the outline is returned and discussed with me, turn in a hard copy and send me an electronic copy (MS Word).

Keep the following in mind when writing the paper:

1. As in the outline, never include any statement that you do not fully understand.

2. Do not use words or phrases that you would not normally use. That is likely to be recognized as plagiarism (see below). For example, do not say “… a feebly basic earth.” You could write “… a weakly basic oxide of…”

3. Be a chemist. Do not include anecdotal statements of uses and toxicity (typical problem areas) that cannot be backed up with at least an attempt at a scientific explanation. For example, the following statement was found on a webpage “Chromium helps insulin metabolize fat, turn protein into muscle, and convert
sugar into energy.” That is not good enough for this paper. What oxidation state of chromium are they talking about and how does it do this. Go beyond the easy reference.

4. Include properly formatted chemical formulae whenever possible. Know the difference between ionic and covalent substances and use IUPAC nomenclature. Ask if you are not sure. Make use of chemical equations and be sure they are balanced and accurate. They will be presented set off from the text (spaces), as in textbooks.

5. Oxidation states and ionic charges are often not the same thing. Oxidation state is given as Roman numerals (iron(III)) and charge is indicated with magnitude first, followed by + or – (Fe³⁺, O²⁻).

6. Do not include atomic number, formula weight, e⁻ configuration, melting and boiling points, etc., in the text or table. Reference the information if it is interesting or unusual (highest melting point on periodic table, longest liquid range of any element, etc.)

7. Do not describe theory (as given in class). You can reference or recognize the significance or origin of a fact.

8. Citations will be in the form of superscript reference numbers, with sources listed in a “Reference” section at the end of the paper. See the section on “Plagiarism” for information on when and where citations are needed. Do not cite every line.

In the past, some papers have read as if each point had been written on an index card, and then thrown together in random order. The organization should be logical, with consistency in format and structure. Make clear why one point follows another: each point should connect with the next. Use transitions between and within paragraphs. Avoid making the same statement several times in the paper.

The grade will be based on: Organization
Depth of coverage
Information interpretation
Correct use of sources
Grammar and mechanics
Professional tone
Correct use of course-specific concepts and terms
Plagiarism: What It Is and How to Avoid It*

In college courses, we are continually engaging with other people’s ideas: we read them in texts, hear them in lecture, discuss them in class, and incorporate them into our own writing. As a result, it is very important that we give credit where it is due. Plagiarism is using others’ ideas and words without clearly acknowledging the source of that information.

To avoid plagiarizing, you must give credit whenever you use:

- another person’s idea, opinion, or theory
- any facts, statistics, graphs, drawings—any pieces of information—that are not common knowledge
- quotations of another person’s actual spoken or written words
- paraphrase of another person’s spoken or written words

Examples of Plagiarism, and of Appropriate Use of Others’ Words and Ideas

Here’s the original text, from page 1 of Lizzie Borden: A Case Book of Family and Crime in the 1890s by Joyce Williams et al.:

The rise of industry, the growth of cities, and the expansion of the population were the three great developments of late nineteenth century American history. As new, larger, steam-powered factories became a feature of the American landscape in the East, they transformed farm hands into industrial laborers, and provided jobs for a rising tide of immigrants. With industry came urbanization—the growth of large cities (like Fall River, Massachusetts, where the Bordens lived) which became the centers of production as well as of commerce and trade.

Here’s an unacceptable paraphrase that is plagiarism:

The increase of industry, the growth of cities, and the explosion of the population were three large factors of nineteenth century America. As steamdriven companies became more visible in the eastern part of the country, they changed farm hands into factory workers and provided jobs for the large wave of immigrants. With industry came the growth of large cities like Fall River where the Bordens lived which turned into centers of commerce and trade as well as production.

The preceding passage is considered plagiarism for two reasons:

- The writer has only changed around a few words and phrases, or changed the order of the original’s sentences.
- The writer has failed to cite a source for any of the ideas or facts.

If you do either or both of these things, you are plagiarizing. Note that this paragraph is also problematic because it changes the sense of several sentences (for example, “steamdriven companies” in sentence two misses the original’s emphasis on factories).
Here’s an acceptable paraphrase:

Fall River, where the Borden family lived, was typical of northeastern industrial cities of the nineteenth century. Steampowered production had shifted labor from agriculture to manufacturing, and as immigrants arrived in the US, they found work in these new factories. As a result, populations grew, and large urban areas arose. Fall River was one of these manufacturing and commercial centers (Williams 1).

This is acceptable paraphrasing because the writer:

- accurately relays the information in the original
- uses her own words
- lets her reader know the source of her information

Here’s an example of quotation and paraphrase used together, which is also acceptable:

Fall River, where the Borden family lived, was typical of northeastern industrial cities of the nineteenth century. As steampowered production shifted labor from agriculture to manufacturing, the demand for workers “transformed farm hands into industrial laborers,” and created jobs for immigrants. In turn, growing populations increased the size of urban areas. Fall River was one of these hubs “which became the centers of production as well as of commerce and trade” (Williams 1).

This is acceptable paraphrasing because the writer:

- records the information in the original passage accurately
- gives credit for the ideas in this passage
- indicated which parts are taken directly from her source by putting those passages in quotation marks and citing the page number.

Note that the writer would still be plagiarizing if those phrases or sentences had been used without quotation marks. Using another person’s phrases or sentences without quotation marks is considered plagiarism even if the source of the phrases or sentences “borrowed” is cited.

**Plagiarism and the Internet**

The internet is a popular source of information for students’ papers, and many questions have arisen about how to avoid plagiarizing these sources. In most cases, the same rules apply as for a printed source: when you refer to ideas or quote from a website, you must cite that source.

If you want to use visual information from a website, many of the same rules apply. Copying visual information or graphics into a paper is very similar to quoting information, and the source of the visual information or graphic must be cited. These rules also apply to other uses of textual or visual information.
**Strategies for Avoiding Plagiarism**

Put in quotations everything that comes directly from the text—especially when taking notes.

Paraphrase, but be sure you are not just rearranging or replacing a few words. Instead, read over what you want to paraphrase carefully; cover up the text with your hand, or close the text so you can't see any of it (and so aren’t tempted to use the text as a “guide”). Write out the idea in your own words without peeking. Check your paraphrase against the original text to be sure you have not accidentally used the same phrases or words, and that the information is accurate.

**Terms You Need to Know**

**Common knowledge**—facts that can be found in numerous places and are likely to be known by a lot of people.

Example: John F. Kennedy was elected President of the United States in 1960.

This is generally known information. You do not need to document this fact.

However, you must document facts that are not generally known and ideas that interpret facts.

Example: According to the American Family Leave Coalition’s new book, Family Issues and Congress, President Bush’s relationship with Congress has hindered family leave legislation (6).

The idea that “Bush’s relationship with Congress has hindered family leave legislation” is not a fact but an interpretation; consequently, you need to cite your source.

**Quotation**—using someone’s words. When you quote, place the passage you are using in quotation marks, and document the source according to a standard documentation style.

**Paraphrase**—using someone’s ideas, but putting them in your own words. This is probably the skill you will use most when incorporating sources into your writing. Although you use your own words to paraphrase, you must still acknowledge the source of the information.

Proofreading for Common Surface Errors: Spelling and Punctuation*

In most college courses, instructors expect that your writing will be free of surface errors, but you may be uncertain of the rules for spelling, punctuation, grammar, and word choice. The following rules and examples, taken primarily from *The St. Martin’s Handbook, 3rd ed.*, by Andrea Lunsford and Robert Connors, may help you find and correct some of the most common surface errors in your writing. If you have questions about these rules, consult any good grammar book.

**Spelling**

Spelling errors are the most common surface errors as well as the most easily corrected. To correct spelling errors, use a spell-checker, regardless of your spelling skill, along with a dictionary to help you find the right alternative for a misspelled word. Remember that the spell-checker won’t help with homonyms, words that sound alike but have different spellings and meanings. Some words that can cause trouble are listed below.

- their (possessive form of *they*)
- there (in that place)
- they’re (contraction of *they are*)

- accept (a verb, meaning *to receive or to admit to a group*)
- except (usually a preposition, meaning *but or only*)

- who’s (contraction of *who is or who has*)
- whose (possessive form of *who*)

- its (possessive form of *it*)
- it’s (contraction of *it is or it has*)

- your (possessive form of *you*)
- you’re (contraction of *you are*)

- affect (usually a verb, meaning *to influence*)
- effect (usually a noun, meaning *result*)

- than (used in comparison)
- then (refers to a time in the past)

- were (form of the verb *to be*)
- we’re (contraction of *we are*)
- where (related to location or place)

- weather (climatic conditions)
- whether (conjunction, meaning *if*)

**separate** and **precipitate** are often spelled incorrectly.
Punctuation

Commas

1. Use a comma to signal a pause between the introductory element of a sentence and the main part of the sentence.

   Frankly, the committee’s decision baffled us.
   Though I gave him detailed advice for revising, his draft only got worse.

2. Use a comma when you join two independent sentences with a conjunction (for, and, nor, but, or, yet, so).

   Meredith wore jeans to the hotel, but she changed before the wedding.

3. If the two clauses in your sentence are both short, however, you may be able to omit the comma before and or or. You may also be able to omit the comma after an introductory element if the element is short.

   She saw her chance and she took it.
   At the racetrack Henry lost nearly his entire paycheck.

4. Use a comma to signal the presence of a nonrestrictive element, that is, a word, phrase, or clause that gives additional information about the preceding part of the sentence, but which can be deleted without changing the basic meaning of the sentence. If the element is in the middle of the sentence, use a comma before and after the element.

   Marina, who was the president of the club, was the first to speak.
   Puerto Rico was a Spanish colony until 1898, when it was ceded to the U.S.

5. Do not use a comma with a restrictive element, that is, a word, phrase, or clause that is essential to the meaning of the word or phrase it modifies. A restrictive element cannot be deleted without changing the sentence’s basic meaning.

   **Wrong:** I’ll return the sweater, that I borrowed, after I wear it tonight.
   **Right:** I’ll return the sweater that I borrowed after I wear it tonight.

   **Wrong:** The people, who vandalized the school, were never caught.
   **Right:** The people who vandalized the school were never caught.

6. Traditionally, commas separate all the items in a series (three or more words, phrases, or clauses that appear consecutively in a sentence).

   Sharks eat squid, shrimp, crabs, and fish.
Apostrophes

1. To show that one thing belongs to another, either an apostrophe and an s or an apostrophe alone is added to the word representing the thing that possesses the other. An apostrophe and an s are used for singular nouns, indefinite pronouns (anybody, everyone, nobody, somebody), and for plural nouns that do not end in s. When plural nouns end in s only the apostrophe is used.

   Overambitious parents can be harmful to a child’s well-being.
   The accident was nobody’s fault.
   Both drivers’ cars were damaged in the accident.

2. The word its, spelled without an apostrophe, is the possessive form of it, meaning of it or belonging to it. The word it’s, spelled with an apostrophe, is a contraction of it is or it has. Even though with nouns an apostrophe usually indicates a possessive form, the possessive in this case is the one without the apostrophe.

   The car is lying on its side in the ditch. It’s a white 1986 Buick.

Periods

1. A comma splice occurs when two or more clauses that could each stand alone as a sentence are written with only a comma between them. To correct this error, separate the clauses with a period or semicolon, connect the clauses with a word like and, for, because, or although, or combine them into one clause.

   Wrong: The ship was huge, its mast stood thirty feet high.
   Right: The ship was huge; its mast stood thirty feet high.
   Right: The ship was huge, and its mast stood thirty feet high.

2. Fused sentences are created when two or more groups of words that could each be written as an independent sentence are written without any punctuation between them. To eliminate a fused sentence, divide the groups of words into separate sentences, or join them in a way that shows their relationship.

   Wrong: Our fiscal policy is not well defined it confuses many people.
   Right: Our fiscal policy is not well defined. It confuses many people.
   Right: Our fiscal policy is not well defined, and it confuses many people.
Quotation marks

1. Use quotation marks to signal direct quotations, titles, definitions, and words used ironically.
   
   George Bush called for a “kinder, gentler” America.
   My dictionary defines isolation as “the quality or state of being alone.”
   The “fun” of surgery begins before the operation even takes place.

2. Periods and commas go inside closing quotation marks; colons and semicolons go outside them.
   
   I would use one word to describe the duke in Browning’s poem “My Last Duchesse”: arrogant.
   One of the Beatles’ first popular songs was “Love Me Do”; it catapulted the band to stardom.

Proofreading for Common Surface Errors: Grammar

Verbs

1. Verbs can be in either active or passive voice. In active voice, the subject of the sentence performs the action of the verb; in passive voice, the subject receives the action of the verb. Readers typically find active voice sentences more vigorous and clearer; for these reasons, writers usually prefer active voice.

   Passive: The ball was kicked by the boy.
   Active: The boy kicked the ball.

   Passive: A decision was reached by the committee.
   Active: The committee reached a decision.

   Passive: Many arguments are offered against abortion.
   Active: Religious leaders offer many arguments against abortion.

   Notice that in the passive voice examples, the doer of the action is either at the end of the sentence in a prepositional phrase or, in the third example, is missing entirely from the sentence. In each active voice example, however, the doer of the action is in the subject position at the beginning of the sentence.

2. On some occasions, however, you might have a good reason for choosing a passive construction; for example, you might choose the passive if you want to emphasize the receiver of the action or minimize the importance of the actor.

   Appropriate passive: The medical records were destroyed in the fire.
   Appropriate passive: The experiment was performed successfully.

   Passive voice verbs always include a form of the verb to be, such as am, are, was, is being, and so on. To check for active versus passive voice, look for sentences that contain a form of this verb, and see whether in these sentences the subject of the sentence performs the action of the verb.
3. If you shift verb tense (for example, from past to present tense) in a sentence or passage without a good reason, you may confuse your reader.

**Wrong:** After he joined the union, Sam appears at a rally and makes a speech.
**Right:** After he joined the union, Sam appeared at a rally and made a speech.

To proofread for verb tense errors, circle all verbs in your writing. Look at the verbs in sequence and check that you haven’t changed tense unintentionally.

**Subject-Verb Agreement**

1. Make sure that the *subject* and *verb* of each clause or sentence agree—that is, that a singular subject has singular verb, and a plural subject a plural verb. When other words come between subject and verb, you may mistake the noun nearest to the verb—before and after—for the verb’s real subject.

**Wrong:** A central part of my life goals have been to go to law school.
**Right:** A central part of my life goals has been to go to law school.

**Wrong:** The profits earned by the cosmetic industry is not high.
**Right:** The profits earned by the cosmetic industry are not high.

2. Be particularly careful that your subject and verb agree when your subject is made up of two or more parts joined by *and* or *or*; when your subject is a word like *committee* or *jury*, which can take either a singular or a plural verb depending on whether it is treated as a unit or as a group of individuals; or when your subject is a word like *mathematics* or *measles*, which looks plural but is singular in meaning.

**Wrong:** My brother and his friend *commutes* every day from Louisville.
**Right:** My brother and his friend *commute* every day from Louisville.

**Wrong:** The committee *was taking* all the responsibility themselves.
**Right:** The committee *were taking* all the responsibility themselves.

**Wrong:** Measles *have become* less common in the United States.
**Right:** Measles *has become* less common in the United States.

To proofread for subject-verb agreement, circle the subject and verb in each sentence and be sure they agree.
**Pronouns**

1. A *pronoun* (like *I, it, you, him, her, this, themselves, someone, who, which*) is used to replace another word—its *antecedent*—so that the antecedent does not have to be repeated. Check each pronoun to make sure that it agrees with its antecedent in gender and number. Remember that words like *each, either, neither*, and *one* are singular; when they are used as antecedents, they take singular pronouns. Antecedents made up of two or more parts joined by *or or nor* take pronouns that agree with the nearest antecedents. Collective noun antecedents (*audience, team*) can be singular or plural depending on whether they refer to a single unit or a group of individuals.

   **Wrong**: Every one of the puppies thrived in their new home.  
   **Right**: Every one of the puppies thrived in its new home.

   **Wrong**: Neither Jane nor Susan felt that they had been treated fairly.  
   **Right**: Neither Jane nor Susan felt that she had been treated fairly.

   **Wrong**: The team frequently changed its positions to get varied experience.  
   **Right**: The team frequently changed their positions to get varied experience.

   To proofread for agreement of pronouns and antecedents, circle each pronoun, identify its antecedent, and make sure that they agree in gender and number.

2. As noted above, most *indefinite pronouns* (like *each, either, neither, or one*) are singular; therefore, they take singular verbs. A *relative pronoun*, like *who, which, or that*, takes a verb that agrees with the pronoun’s antecedent.

   **Wrong**: Each of the items in these designs coordinate with the others.  
   **Right**: Each of the items in these designs coordinates with the others.

   **Wrong**: He is one of the employees who works overtime regularly.  
   **Right**: He is one of the employees who work overtime regularly.

   (In this example, the antecedent of *who is employees*, and therefore the verb should be plural.)

3. A vague pronoun reference occurs when readers cannot be sure of a pronoun’s antecedent. If a pronoun could refer to more than one antecedent, or if the antecedent is implied but not explicitly stated, revise the sentence to make the antecedent clear.

   **Wrong**: Before Mary assaulted Mrs. Turpin, she was a judgmental woman.  
   **Right**: Before Mary assaulted Mrs. Turpin, the latter was a judgmental woman.

   **Wrong**: They believe that an egg is as important as a human being, but it can’t be proved.  
   **Right**: They believe that the egg is as important as a human being, but such an assertion can’t be proved.
Other Grammatical Errors

1. The sentence fragment is an incomplete sentence punctuated as a sentence. To make it a complete sentence, join it to the main clause or rewrite it.

   **Wrong:** She is a good friend. A person whom I trust and admire.
   **Right:** She is a good friend, a person whom I trust and admire.

   **Wrong:** In the workshop, we learned the value of discipline. Also how to take good notes.
   **Right:** In the workshop, we learned the value of discipline. We also learned how to take good notes.

   **Wrong:** The old aluminum boat sitting on its trailer.
   **Right:** The old aluminum boat was sitting on its trailer.

To proofread for sentence fragments, check all sentences for a subject, a verb, and at least one clause that does not begin with a subordinating word like *as, although, if, when, that, since, or who.*

2. Misplaced or dangling modifiers are words, phrases, or clauses not clearly connected to the word they modify. Move a misplaced modifier closer to the word it describes, or revise a sentence to give a dangling modifier a word to modify.

   **Wrong:** They could see the eagles swooping and diving with binoculars.
   **Right:** With binoculars, they could see the eagles swooping and diving.

   **Wrong:** Nixon told reporters that he planned to get out of politics after he lost the 1962 gubernatorial race.
   **Right:** After he lost the 1962 gubernatorial race, Nixon told reporters that he planned to get out of politics.

   **Wrong:** A rabbit’s teeth are never used for defense even when cornered.
   **Right:** Even when cornered, a rabbit never uses its teeth for defense.

   **Wrong:** As a young boy, his grandmother told stories of her years as a country schoolteacher.
   **Right:** As a young boy, he heard his grandmother tell stories of her years as a country schoolteacher.

To proofread for misplaced or dangling modifiers, circle all modifiers and draw a line to the word they describe; be sure they can’t mistakenly modify some other word.
**General Proofreading Suggestions**

1. Familiarize yourself with the errors you commonly make by looking over writing that has already been marked. Make a list of your errors, and check your writing for each of them.

2. Carefully and slowly read your writing out loud. Often your ear will hear what your eye did not see.

3. Read your writing backwards, sentence by sentence, from the last sentence to the first sentence. This technique interrupts the logical flow of the prose and neutralizes any impression of correctness arising from your knowledge of what you meant to say.

4. Use your dictionary to check any words you’re unsure about, and to check for correct prepositions, verb tenses, and irregular forms.

5. Commas, periods, and apostrophes are sometimes more complicated than the examples illustrated in this text. Consult a handbook for any other questions.

6. Set the paper aside for a few days. You will read the paper without as many assumptions and it helps prevent procrastination.