

Environmental Chemistry

Written Response 1

Due Tuesday, September 15, 2009 (at the start of class)

Provide the following feedback (on this sheet) on Baird and Cann (BC) pp. 27-51 and Spiro, Purvis-Roberts, and Stigliani (SPS) Chapter 4, pp. 1, 4-15

Strengths (what was clear, interesting, and/or intriguing?)

BC: The descriptions of the different types of UV and what absorbs each in the atmosphere were detailed and interesting. I was surprised to learn that in the ozone layer the concentration of ozone is on the order of 10ppm, in previous classes (junior high, high school etc) where I learned about the ozone layer it always sounded like there was a lot more ozone up there. *good*

SPS: The comparison of CO₂ emitted by humans to the amount of ozone was interesting, the descriptions of the O₂/O₃ mechanisms were clear in both texts. *yes*

Weaknesses (what was unclear, boring, or missing?)

BC: There was a lot of detail about the effects of UV on humans, I think it went overboard. It's good to know about the dangers of exposure but *OK* not at such length.

SPS: This text went into less detail with explaining the Chapman mechanism but what was present was clear. The pictures/diagrams are a little more difficult to interpret but *↑* they aren't unclear.

I agree

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Strengths (what was clear, interesting, and/or intriguing?)

BC

I liked how they used a lot of real world examples of how UV radiation will affect the environment. They lay everything out fairly simply and it is easy to understand what they are trying to get across.

SPS

Went into better detail, explaining how the processes went more in depth. The transitions were very good, it seemed like it was moving along in a logical order. I really liked how they talked you through example problems. Better description of radical chemistry. **I agree**

Weaknesses (what was unclear, boring, or missing?)

BC

I felt like it jumped around, spitting out random facts. I ~~don't~~ feel like they were telling me all they knew rather than teaching me. Didn't go into a whole lot of detail, mechanisms **yes**

SPS

It was a little dry, I couldn't really follow with all of the graphs (some didn't print right) and they didn't ~~the~~ make many interesting points about the topic. Very mathy. **(Figure 4.7 in particular)**

Casey Christopher

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2/2 excellent!

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Strengths (what was clear, interesting, and/or intriguing?)

- BC → Explained the trends in temperature change throughout the atmosphere via ozone rxns. Biological effects were presented well → general enough for chemistry students but **yes** specific enough to be quite interesting. Chapman mechanism and catalytic destruction of O_3 were thoroughly described and their interaction was explored. Figures used were illustrative and helpful, integrated well with the text.
- SPS → The book had a more scholarly viewpoint of the ozone layer. Effects on humans & animals as well as human action to avoid destruction of the ozone are the center of the text and allow for better organization of the text. **good point**. The calculations of UV light transmission through the stratosphere and the **yes** ozone steady-state were well-worked and informative concerning quantitative aspects of the process of filtering UV light.

Weaknesses (what was unclear, boring, or missing?)

- BC → Generally slow, spent too much time reiterating basic stuff → photochemical reactions. Could have used tables to simplify data → what molecules filter what type of UV radiation at what region of the atmosphere? what rxns. create/destroy O_3 in what region of the atmosphere? **very good point**
- SPS → The only weakness with this text is that not as much text explains the density of the atmosphere, but much focus is on the effects of changes in ozone concentration and human action concerning these changes. I actually liked this style compared to BC, but with more complicated chemistry, less coverage (if there is in fact less) may not make the chemistry clear enough. **OK**

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Strengths (what was clear, interesting, and/or intriguing?)

BC: Troposphere \rightarrow 85% of atmosphere's mass. of free-radical

I thought the steady-state analysis of atmospheric reactions was interesting. The mathematical arguments presented nicely supplemented the observations early in the book. I also thought that the explanations provided were presented so people with little background in chem could also understand. The biological consequences were also interesting.

SPS: The discussion of free radical chain reactions was good. The transmission of UV through ozone calculation was also interesting.

Weaknesses (what was unclear, boring, or missing?)

BC: The placement of the problems in the middle of sections was disruptive.

Good point

SPS: I felt that this text lacked a physical chem explanation of the role the atmosphere plays in filtering out UV rays (like the one in BC). Also, the steady-state calculation was not as clear as that in BC. OK

5/5

Additional Comments or Questions

BBB

Why is the ozone thinnest at the poles?
North vs. South?

↑ good questions; I'm glad you asked them in class!

Good point

OK

2/2

good work

Elizabeth Kringen
Environmental Chemistry
Chem 394-01
Kuwata
Written Response 1
Due 15 September 2009

Strengths (what was clear, interesting, and/or intriguing?)

After reading Chapter 1 in BC, I felt I had a much better understanding of the regions of the atmosphere and the molecular interactions/reactions of oxygen in the stratosphere and troposphere to create ozone, along with the causes of its depletion. The reading was very thorough about explaining the importance of diatomic oxygen and ozone, the absorption of UV radiation, and the photochemical reactions that take place in the atmosphere. I found the section of the reading on the creation and destruction of ozone to be very interesting. I had never thought about how complex the formation and degradation of ozone in the atmosphere was. I now have a much better understanding of the reactions that take place in the stratosphere, along with their importance. I found BC to be very complete and comprehensive on much of the topics addressed in Chapter 1, particularly for its physical chemistry such as the kinetics and thermodynamics. In SPS, I thought the lapse rate was explained nicely, as well as how and why it changes as the altitude varies. The text did a very good job explaining and referencing the coinciding figure (Figure 4.5) about the atmospheric structure and density in SPS that went along with lapse rate. This made following the figure and understanding how lapse rate works very efficient. The worked out problems in SPS, I noted, were also very clear and stepwise. Overall, I feel like I now have a very good understanding of the different types of UV light, as well as how sunscreen and the ozone layer function to protect us from the most harmful types of UV radiation.

yes

Weaknesses (what was unclear, boring, or missing?)

After reading BC, I found SPS to also be interesting but not quite as thorough in its explanations as BC, but maybe that is just because I read BC first. I thought the flow of its reading wasn't quite as easy to read as BC, though I did not encounter any difficulties in my reading of SPS. I simply found SPS not to be as captivating of a read. The beginning of Chapter 1 in BC wasn't quite as interesting as the latter parts of the chapter, particularly pertaining to the section on atmospheric units and its repetition on explaining the mole fraction scale. I felt that explanation could have been more condensed. Regarding SPS, I had found Figure 4.7 about the ozone's absorption of UV light along the spectrum a little confusing at first due to the alterations of the figure.

Yes, there is some error in the .pdf

2/2

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Strengths (what was clear, interesting, and/or intriguing?)

- BC - PS 34. Section on skin cancer is very interesting.
- PD - 50 - interesting connection with p-chem lab last year.
- SPS - pg. 1 - easy to read but not lacking in content. Also interesting trivia about supersonic jet, a possible foreshadowing of future content. **yes**
- pg 6 - accounts the temperature inversion to the absorption of UV, however BC is more detailed by explaining the process through enthalpy of reactions. **OK**
- PS 9-10 - nice highlight on absorption rates
- PS 14-15 - kind of lengthy section on free radicals.

Weaknesses (what was unclear, boring, or missing?)

BC - pg 32 first sentence is unclear.

PD 37-38 ← had to read twice

SPS - PS 1 - T.I.P.O

↑
good to note

provide more
detail next time