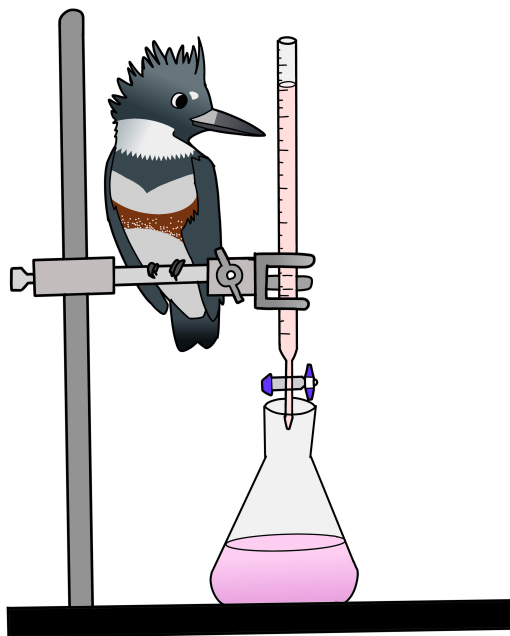


# BirdSO Mini Invitational

Roland Hu and Nayrie Patel

11-18 December 2021



## Directions:

### Basic Introduction + Instructions

Hello competitors! My name is Roland Hu (University of Washington Biochem 2024, formerly Palo Alto HS 2020) and I'll be your BirdSO Environmental Chemistry Co-Event Supervisor. I never actually competed in Environmental Chemistry but I did compete in a lot of Chem Lab and feel confident in my skills at a test writer (I wrote Chem Lab for BirdSO last year!).

Hi y'all, I'm Nayrie Patel (Lexington High School 2022), and I'll be the other BirdSO EnviroChem ES! I'm currently competing in Environmental Chemistry but have a background in Water Quality (rest in peace T-T), GeoMapping, and Forensics. Before you get started please read the following.

1. The test is 50 minutes long and going by BirdSO rules, can be done asynchronously, however we'll be on the event supervisor page on scilympiad for any immediate questions. You can also email Roland or message on discord if something comes up (contact information is below).
2. The test is a collection of 4 sections with 66 questions (140 pts total) on environmental topics, legislation, and chemistry.
3. Each question will start with a textbox full of background information, constants, conditions, procedures, memes, etc. so do read them carefully.
4. You can assume everything is happening at standard lab pressure and temperature (293 K, 1 atm) unless otherwise specified. Most problems will mention this in the background textbox.

5. Type in your work. You don't have to show every single step but do show the important intermediate steps as it makes it easier to give partial credit especially on the longer calculation problems.
6. For anything involving subscripts, superscripts, or any other weird formatting things, you can ignore them as long as what you are typing isn't too ambiguous. For example, typing in  $10^{-5}$  or CO<sub>3</sub><sup>2-</sup> is fine.
7. Sig figs don't really matter in anything beyond that first unit test you take in any general chem class. So for this test I won't be taking sig figs into account but you should still try to use an appropriate number of sig figs. Just don't use too little or too much as certain experimental apparatus are not that accurate or inaccurate.
8. You can use a calculator and notes from your binder as per the National Rules.
9. Another general test taking tip is the principle of Occam's razor. "Sometimes the simpler explanations are more correct".
10. Good luck and have fun! (:

If you have any questions about the exam after it has concluded whether you are a BirdSO competitor, another competitor taking this test for practice, reviewing the solutions and notice a mistake, or have any questions on Section 4 of the exam, please email Roland at [rolandhu123@gmail.com](mailto:rolandhu123@gmail.com) or message me on discord at r\_hudini8811. If you have any questions on sections 1-3, you can email Nayrie at [get2nayrie@gmail.com](mailto:get2nayrie@gmail.com) or message me on discord at nayrie0963. Enjoy!

Page	Points	Score
3	15	
4	21	
5	18	
6	12	
7	16	
8	19	
9	17	
10	9	
11	13	
Total:	140	

1. (0 points) Please type the following text exactly as written:

The work on this test is solely our own. I accept the consequences of academic dishonesty.

**Solution:** If they don't type in the statement give them a 0 on the exam. Though I hope no one cheats because that would be very sad.

2. (1 point) What is your favorite branch of chemistry? (This one's a freebie :D)

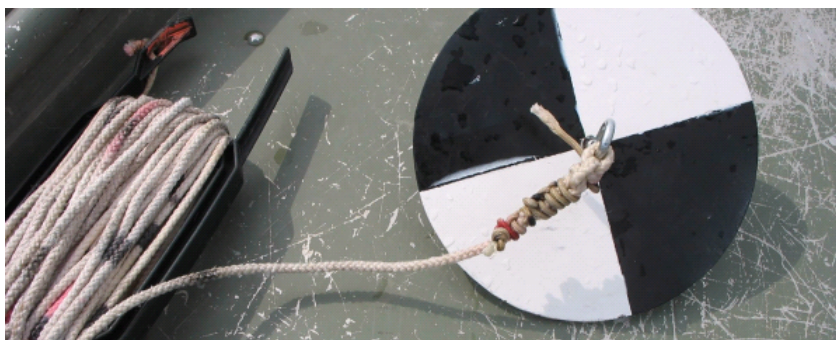
**Solution:** Accept all answers even ones that aren't branches of chemistry. This is just here so I can increase the question count on my tests Low-key I expect a lot of "environmental chemistry" here

## 1 General Environmental Concepts

Answer the following questions on topics such as environmental issues, wastewater treatment processes, water quality, etc.

3. (6 points) Describe the process of eutrophication in detail. Include the following terms in your response: HAB(s), limiting nutrient, dead zone(s).

**Solution:** Eutrophication is the process by which a body of water is enriched with excess nutrients which leads to dense algal growth and decreased DO content. [1] Nitrogen is the limiting nutrient in marine ecosystems, and phosphorus is the limiting nutrient in freshwater environments. [1] Agricultural runoff contains these nutrients and therefore leads to HABs, which are dense patches of algae on the surface of water bodies. [1] These algae cover significant parts of the water body and stop sunlight from penetrating the water's surface. This prevents aquatic plants from producing oxygen through photosynthesis, further decreasing the DO content. [1] When the algae on the surface die, their organic matter is broken down by bacteria which require oxygen to decompose. This process increases the biological oxygen demand (BOD) and therefore decreases the amount of oxygen available. [1] All of these processes combined create dead zones or hypoxic areas. [1]



4. (4 points) Name the tool shown in the image above and list 3 units that are used to measure turbidity.

**Solution:** Secchi disk [1], Nephelometric Turbidity Units (NTU), Jackson Turbidity Units (JTU), Formazin Turbidity Units (FTU), Formazin Nephelometric Units (FNU), Formazin Attenuation Units (FAU) [1pt for each correct unit]

5. (4 points) Answer the following questions related to the nitrogen cycle.

What is the process in which bacteria convert  $\text{NH}_3$  to  $\text{NO}_2$  and  $\text{NO}_3^-$ ? [1pt] What is the process in which  $\text{NO}_3^-$  and  $\text{NH}_3$  are incorporated by plants into proteins, nucleic acids, and other important organic molecules? [1pt]

What conditions are required for denitrification to occur? [1pt] Why isn't N<sub>2</sub> immediately usable for organisms in its gaseous state? [1pt]

**Solution:** 1. Nitrification [1] 2. Assimilation [1] 3. Hypoxic/anaerobic [1] 4. The triple bond between N atoms isn't easily broken by plants and animals [1]

6. (2 points) What is the difference between a pollutant and a contaminant?

**Solution:** A pollutant refers to a substance which increases in quantity due to human activity and adversely affects the environment. [1] Meanwhile, a contaminant is a substance which is not present in nature but released during human activity. [1]

7. (3 points) List the 6 steps of potable water treatment in order.

**Solution:** Coagulation, Flocculation, Sedimentation, Filtration, Disinfection, and Distribution. [3pts for correct order, -0.5pts for each incorrect placement]

8. (7 points) List the steps/processes involved in each of the 3 phases of wastewater treatment.

Primary Treatment Secondary Treatment Tertiary Treatment

**Solution:** 1. Screening, grit removal, sedimentation/clarification [3pts] 2. Aeration, sedimentation/clarification, disinfection [3pts] 3. Nutrient removal [1pt]

## 2 Clean Water Act

Answer the following questions regarding pages 1-59 and 150-234 of the Clean Water Act.

9. (2 points) When was the Clean Water Act first introduced, and what was it originally called?

**Solution:** 1948 [1], Federal Water Pollution Control Act [1]

10. (1 point) In which of the following years was the Clean Water Act NOT amended?

- A. 1977
- B. 1966
- C. 2014
- D. 1952**

11. (5 points) List the 5 main titles of the Clean Water Act in order.

**Solution:** Title I (Research and Related Programs) Title II (Grants for Construction of Treatment Works) Title III (Standards and enforcement) Title IV (Permits and licenses) Title V (General Provisions) [1pt each, 5pts total]

12. (1 point) What event did NOT ultimately contribute to the first Earth Day event?

- A. "Earthrise", photographed by the Apollo 8 space mission crew

**B. The Three Mile Island Accident (partial meltdown of nuclear power plant)**

- C. The publication of Silent Spring by Rachel Carson
- D. The 1969 Santa Barbara Oil Spill

13. (8 points) Silent Spring, published in 1962 by Rachel Carson, led to a nationwide ban on the use of DDT in agriculture and the formation of the EPA. Answer the following questions regarding this pesticide.

What is the full name of DDT? [1pt] What was DDT used for before it became widely known as a pesticide? [1pt] List 2 reasons why DDT was used as a pesticide before it was banned. [2pts] Explain why DDT is considered a highly polluting hazard today. [2pts] Describe the effects of DDT on a) birds and b) humans. [2pts]

**Solution:** 1. dichloro-diphenyl-trichloroethane [1pt] 2. It was used by the military in WWII to control malaria, typhus, lice, and other diseases [1pt] 3. It was inexpensive to manufacture and was highly effective in killing insects [2pt] 4. It is very insoluble/hydrophobic in water so it's absorbed by aquatic organisms and takes about 2-15 years to break down [2pts] 5a. Through biomagnification and bioaccumulation, predatory bird species such as bald eagles, pelicans, ospreys, and peregrine falcons experienced diminished fertility and thinning eggshells which broke easily. [2pts] 5b. In small amounts, DDT can result in diarrhea, nausea, and irritation. In high doses, DDT interferes with nerve impulses and causes nerve cells to generate extra impulses which explains the erratic tremors, convulsions, and seizures in exposed organisms. [2pts]

14. (1 point) The Clean Water Act clearly defines "waters of the United States".

A. True

**B. False**

15. (2 points) If you answered true to the previous question, leave this one blank. You'll still receive points if you have the right answer.

If you answered false, where is "waters of the United States" actually defined?

**Solution:** The Clean Water Rule was released in 2015 by the EPA and overturned by the federal government in 2019. [2pts]

For the following questions, provide the general definitions for each of the following terms as stated in the Clean Water Act.

16. (3 points) Pollutant

**Solution:** dredged spoil, solid waste, incinerator residue, sewage, garbage, sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste [0.5pts for each relevant example, can get 3pts total]

17. (2 points) Toxic pollutant

**Solution:** pollutants that will cause death, disease, cancer, mutations, deformations, [1] etc after exposure, ingestion, inhalation, or assimilation in organisms or their offspring. [1]

18. (2 points) Medical waste

**Solution:** Isolation wastes, infectious agents, human blood and blood products, pathological wastes, sharps, body parts, contaminated bedding, surgical wastes and potentially contaminated laboratory wastes, dialysis

wastes [0.5pts for each relevant example, can get 2ts total]

19. (3 points) Point source

**Solution:** any discernible, confined transportation of pollutants [1] including any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are discharged. [0.5 pts for each relevant source, can get 2 pts total]

20. (3 points) Floatable material

**Solution:** any foreign matter that may float or remain suspended in the water column [1] such as plastic, aluminum cans, wood products, bottles, and paper products. [0.5pts for each relevant example, can get 2pts total]

21. (1 point) Navigable waters

**Solution:** the waters of the United States, including the territorial seas [1]

22. (2 points) Coastal recreation waters

**Solution:** include the Great Lakes and marine coastal waters (including coastal estuaries) used for swimming, bathing, surfing, etc. [1] This term does NOT include inland waters or waters upstream of the mouth of a river or stream having an unimpaired natural connection with the open sea. [2]

Match the following descriptions to the corresponding section of the Clean Water Act.

23. (1 point) Requires standards for thermal pollution to ensure the protection of fish and wildlife in the body of water into which the discharge is occurring.

A. 309

**B. 316**

C. 319

D. 402

24. (1 point) Authorizes the NPDES Permits program which states that conventional industrial and municipal dischargers must obtain permits from the EPA for discharging materials into the waters of the United States.

A. 309

B. 316

C. 319

**D. 402**

25. (1 point) The EPA is authorized to seek civil or criminal penalties for some violations of the Clean Water Act.

**A. 309**

B. 316

C. 319

D. 402

26. (1 point) Created the Nonpoint Source Management Programs which provide grants to states, territories, and Indigenous tribes to cover program implementation costs.

A. 309

B. 316

**C. 319**

D. 402

### 3 IWOCM

Answer the following questions regarding all of the Indiana Wastewater Operator Certification Manual.

27. (4 points) List the 4 steps required to become a certified operator.

**Solution:** 1. Meet the educational and experience requirements set forth in the certification rule and statute  
2. Complete the application to sit for the certification exam 3. Pay a 30*application fee* 4. *Pass the exam with a score of 70* [4pts]

28. (4 points) Class I certified operators are certified to operate which of the following types of treatment facilities?

☒ **Class I-SP**
☒ **Class I**
☐ Class II

☐ Class III

☒ **Class A-SO**
☒ **Class A**

29. (2 points) What is the minimum dissolved oxygen requirement in surface waters of the State of Indiana?

**Solution:** Concentrations of dissolved oxygen shall average at least 5 mg/L per calendar day [1pt] and shall not be less than 4 mg/L at any time. [1pt]

Answer the following Operator Exam Practice Questions from the Indiana Wastewater Operator Certification Manual.

30. (2 points) What are the goals of the state regarding water quality?

**Solution:** The goals of the state regarding water quality are to restore and maintain the chemical, physical and biological integrity of the waters of the state. [2pts]

31. (3 points) My wastewater treatment plant receives brine wastes from water softeners. Do I have to be concerned about the salt content of my discharge?

**Solution:** Yes. The salt discharge could increase the dissolved solids concentration of your discharge. [1]  
The state water quality standards require that dissolved solids shall not exceed 750 mg/L in any waters. [1]

In the typical municipal type wastestream, dilution from other domestic sources should keep your effluent below the standard, but in certain conditions, where there is a large industrial discharge, it could be a problem. [1]

32. (4 points) What is meant by “Best Management Practices”, or “BMPs”?

**Solution:** BMPs are actions to prevent or reduce the pollution of waters of the state [1] including (a) Schedules of activities, (b) Prohibitions of practice, (c) Treatment requirements, (d) Operation and maintenance procedures, (e) Use of containment facilities, (f) Other management practices. [0.5 for each example, 3 total]

33. (1 point) What does “NPDES” stand for?

**Solution:** National Pollutant Discharge Elimination System

34. (1 point) What is the maximum term of a NPDES permit?

**Solution:** NPDES permits are limited to a maximum term of five years. [1] Most permits are issued for the maximum term. Permits of less than five years duration may be issued in appropriate circumstances at the discretion of the commissioner.

35. (2 points) What is a “four day average discharge”?

**Solution:** The calculated result of totaling the mass or average concentration of all daily discharges sampled or measured during four consecutive sampling days, [1] though not necessarily consecutive calendar days, divided by the number of daily discharges sampled or measured. [1]

36. (2 points) If there are two or more wastewater treatment plants at one industrial site and each independent wastewater treatment plant is classified as a Class B or Class C wastewater facility, how will that industrial site be classified?

**Solution:** Class D

## 4 Chemistry!

Problem 1: Air is no alternative to air

These questions all relate to the atmosphere with a bit of gas phase kinetics.

37. (6 points) Name the 3 major gases compose the majority of Earth’s atmosphere and in what relative percentages? (You can also give a range of percentages: Gas 1: 10-20

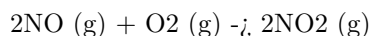
**Solution:** a. Nitrogen (N<sub>2</sub>) 78b. Oxygen (O<sub>2</sub>) 21c. Argon (Ar) 1d. 1 pt for the right gas 1 pt for the right percentage Anywhere within 5

38. (3 points) Name 3 other minor gases that account for  $\leq 1$



**Solution:** a. Water, CO<sub>2</sub>, methane, helium, ozone, etc b. 1 Pt for each right gas, c. There could be other right answers, if it seems reasonable you can still give the point.

The next set of questions will relate to the following reaction:



You can assume that this is an elementary process

39. (2 points) What is the rate law for this reaction?

**Solution:** a. Rate =  $k[\text{NO}]^2[\text{O}_2]$  b. 1pt for having [NO] and [O<sub>2</sub>] c. 1pt for the right order

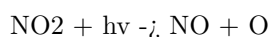
40. (4 points) Going off your previous answer what can you say about the feasibility of this reaction? In air the concentration of NO is 1ppm whereas the O<sub>2</sub> is 210,000 ppm. Using this write a new rate law and give reasoning to why we can do this approximation. Do you expect it to occur as written or in some other way?

**Solution:** a. This reaction is actually a trimolecular reaction, which is uncommon because having 3 reactants colliding with the right orientation and sufficient energy is unlikely. Therefore, maybe it might be pseudo 2nd order reaction. b. Because O<sub>2</sub>  $\gg$  NO we can treat O<sub>2</sub> as a constant where  $k' = k[\text{O}_2]$  making the new Rate =  $k'[\text{NO}]^2$  c. 2 pts for saying it's trimolecular and why it's unlikely to happen d. 2 pts for the new rate law

41. (5 points) The half-life of NO has been estimated to be 100 hrs. Under the new rate law determined in the previous question, what would the half-life be if the initial NO concentration were increased to 12 ppm?

**Solution:** a.  $[\text{NO}] = 1\text{ppm}$   $t_{1/2} = 100\text{ Hr}$  b.  $T_{1/2} = 1/[\text{A}]K'$   $k' = 1/[\text{A}]t_{1/2} = 1/1\text{ppm} \cdot 100\text{hr} = 1\text{e-}2$   $1/\text{ppm} \cdot \text{hr}$  c. Sub in  $k'$  into the original with the new concentration d.  $T_{1/2} = 1/12 \cdot 1\text{e-}2 = 1/.12 = 8/3$  Hr e. 3 pt for work 2 pt for right answer f. -1 pt if they don't give the right units

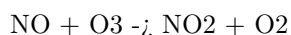
An important aspect of Nitric oxides is that they react with oxygen and ozone within the atmosphere. Given the following reactions and heat of fusions, answer the following questions.



$$\Delta H = 90.3 \text{ kJ/mol}$$



$$\Delta H = 249.3 \text{ kJ/mol}$$



$$\Delta H = 33.2 \text{ kJ/mol}$$

\* $h\nu$  represents UV light, just a catalyst

\*\*Chapman cycle, non-reactive species that takes up energy

42. (4 points) What is the maximum wavelength of light that can photodissociate NO<sub>2</sub>.

**Solution:** a.  $\Delta H' = 90.3 + 249.3 - 33.2 = 306.3 \text{ kJ/mol}$  b.  $\lambda = hcN/\Delta H = 6.626\text{e-}34 \cdot 3\text{e}8 \cdot 6.022\text{e}23 / 306.3\text{e}3 = 3.91\text{e-}7$  391 nm c. 2 pts for work 2 pts for right answer

43. (2 points) Do you think this reaction to occur in the troposphere and why?

**Solution:** a. Yes, there are plenty of UV active photons in the troposphere to carry out this reaction b. 1 pt for the right answer and 1 pt for the right reasoning

44. (2 points) What color do you expect for NO<sub>2</sub> to be? (hint think about absorption)

**Solution:** a. The absorption is blue so it should appear orange-brown. b. 2 pts for the right answer

#### Problem 2: Fuel for Climate Change

The majority of the world's power comes from fossil fuels. Fossil fuels are nice since they are convenient to burn, energy dense, "widely" available, and make good subject for comics. What is not so nice about fossil fuels is the carbon emissions they produce. Carbon dioxide emissions from fossil fuels are one of the major contributors to climate change. It is clear that within the next couple decades' humanity has to come up with an alternative to solve this energy crisis. The government has recruited BirdSO test takers to handle this crisis by letting you take command of their fuel research department (lucky you!).

You can assume everything takes place at 298 K and 1 atm.

45. (2 points) You have looked into hydrogen gas as a possible alternative to fossil fuels. However, you are stumped on how to get hydrogen. You figure out one way you can form hydrogen is by reacting methane with water to get CO<sub>2</sub> and Hydrogen gas. Write out this equation and balance it.

**Solution:** a.  $\text{CH}_4(\text{g}) + 2\text{H}_2\text{O}(\text{l}) \rightarrow \text{CO}_2(\text{g}) + 4\text{H}_2(\text{g})$  States are not necessary b. 1 pt for writing out the expression 1 pt for balancing it

46. (2 points) When your supervisors see your expression they get super paranoid. Your reaction produces CO<sub>2</sub> which as stated in the background is a nu Bueno. You assure them that this CO<sub>2</sub> can be easily capture and will not be released into the atmosphere. Suggest 2 ways of capturing CO<sub>2</sub>.

**Solution:** a. A lot of things could work for this question. Filters, catalytic converters, using amine-based solvents, gas separation, CCS, potassium carbonate, making soda water, using basalt, etc. Accept anything that makes sense. You can be pretty lenient on this but reject anything that is super vague. b. 1 pt for each suggestion.

47. (2 points) After getting the approval of your superiors you then set out to calculate the enthalpy for your reaction. Here are some helpful values.

Enthalpy of formation of CH<sub>4</sub>(g) = 74.8 kJ/mol

Enthalpy of formation of CO<sub>2</sub>(g) = 393.5 kJ/mol

Enthalpy of formation of H<sub>2</sub>O(l) = 285.8 kJ/mol

**Solution:** a. Products heat – reactants heat  $-393.5 - (-74.8 + 2 * 285.8) = 253 \text{ kJ/mol}$  b. 1 pt for work 1 pt for correct answer

48. (1 point) Another way of producing hydrogen gas is through the electrolysis of water. You are given the 2 following half reactions and overall cell reaction.

$2\text{H}_2\text{O}(\text{l}) \rightarrow \text{O}_2(\text{g}) + 4\text{H}^+(\text{aq}) + 4\text{e}^-$

$2\text{H}^+(\text{aq}) + 2\text{e}^- \rightarrow \text{H}_2(\text{g})$

$2\text{H}_2\text{O}(\text{l}) \rightarrow 2\text{H}_2(\text{g}) + \text{O}_2(\text{g})$

Which half reaction occurs at the cathode?

**Solution:** a.  $2\text{H}^+ (\text{aq}) + 2\text{e}^- \rightarrow \text{H}_2$  It is okay to say the 2nd reaction b. 1 pt for the right half reaction

49. (2 points) What is the enthalpy change for the overall cell reaction?

**Solution:** a.  $\Delta H_{\text{cell}} = 2 \times 285.8 = 571.6 \text{ kJ/mol}$  Do not accept negative answers b. 1 pt for the right answer  
1 pt for the work

50. (3 points) What is the cell potential? (hint you might want to use this value below)

Entropy of formation of  $\text{H}_2\text{O}(\text{l}) = 163.0 \text{ J/K/mol}$

**Solution:** a.  $S = 2 \times 163.0 \text{ J K}^{-1} \text{ mol}^{-1} = +326.0 \text{ J K}^{-1} \text{ mol}^{-1}$   $G = 571.6 \text{ kJ mol}^{-1} - 298 \text{ K} \times 0.326 \text{ kJ K}^{-1} \text{ mol}^{-1} = +474.5 \text{ kJ mol}^{-1}$   $E = 474.5 \times 10^3 \text{ J mol}^{-1} / (4 \times 96485 \text{ C mol}^{-1}) = 1.23 \text{ V}$  b. 2 points for relating gibbs and potential 1 pt for the right answer

### Problem 3: Better “Cop” this Problem

Copper is a wonderful metal, often found in various alloys used in structure, corrosion protection, and of course pennies. One popular use of copper is the production of certain copper salts such as copper (II) nitrate and copper (I) oxide. Copper (II) nitrate is often used as an insecticide/pesticide and copper (I) oxide is used as a corrosion prevention paint. Unfortunately, copper can also be quite toxic and is one of the most common types of metal poisoning, and is especially dangerous to aquatic life.

You are given a  $1.00 \times 10^{-2} \text{ M}$  solution of copper (II) nitrate which a pH of 4.65.

51. (3 points) What is the equation for the formation of the conjugate base of the hydrated  $\text{Cu}^{2+}$  ion?

**Solution:** a.  $\text{Cu}(\text{H}_2\text{O})_4^{2+}(\text{aq}) + \text{H}_2\text{O}(\text{l}) = [\text{Cu}(\text{OH})(\text{H}_2\text{O})_3]^+ + (\text{aq}) + \text{H}_3\text{O}^+ + (\text{aq})$  i.e. this one is the better one b.  $\text{Cu}^{2+}(\text{aq}) + \text{H}_2\text{O}(\text{l}) = \text{CuOH}^+ + (\text{aq}) + \text{H}^+ + (\text{aq})$  c. Both of these equations are okay d. 1 pt for having some form of copper, 1 pt for having water on the left, and 1 pt for having the right CuOH complex

52. (2 points) What is the pKa of the conjugate acid base pair?

**Solution:** a.  $\text{pH} = \frac{1}{2} \text{pKa} - \frac{1}{2} \log c$  b.  $\text{pKa} = 2 \text{pH} + \log c = 9.30 - 2.00 = 7.30$  c. 1 pt for the work 1 pt for answer

53. (3 points)  $K_{\text{sp}}$  Copper (II) hydroxide or  $\text{Cu}(\text{OH})_2 = 1 \times 10^{-20}$ . Using this and the values from the start, calculate the pH of the pH where copper (II) hydroxide precipitates out.

**Solution:** a.  $K_{\text{sp}} = [\text{Cu}^{2+}][\text{OH}^-]^2 = 1 \times 10^{-20}$  b.  $[\text{Cu}^{2+}] = 1.00 \times 10^{-2}$  so  $[\text{OH}^-]^2 = 10^{-18} \rightarrow \text{pOH} = 9$  c. 2 pts for work d. 1 pt for the right answer

**Conclusion:**

Thank you for participating!