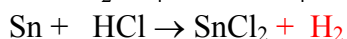
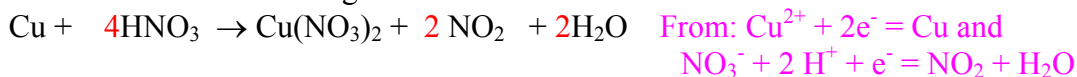


CHE 112 EXAM 3 Name _____

1-2. Balance the following half-reactions:

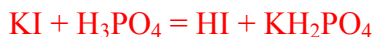


3-5. Balance the following redox reactions:



6. The most stable oxidation numbers for lead (**Pb**) are 0,2,4

9. Write a balanced chemical equation for a laboratory preparation of **HI** gas.



10-11. Write the formula for each of the following compounds and indicate the oxidation numbers of all atoms:



12. The SO_3 molecule is planar, but the SO_3^{2-} ion is trigonal pyramidal. Explain why.

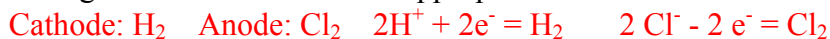
Lone pair on S atom in SO_3^{2-} (Sulfur (IV) has alone pair)

13. A layer of silver is electroplated on a coffee server using a constant current of 0.2 A. How much silver (in g) will deposit in 1 hour? $m = AW_{\text{Ag}} \times I \times t / F = 108 \times 0.2 \times 3600 / 96500 = 0.81 \text{ g}$

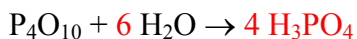
14. Write a Nernst equation for the following reaction: $\text{Ce}^{4+} + \text{e}^- \rightarrow \text{Ce}^{3+}$

$$E = E_0 + (RT/F) \ln([\text{Ce}^{4+}]/[\text{Ce}^{3+}])$$

15-16. What products are formed when the aqueous potassium chloride is electrolyzed in a cell having inert electrodes? Write appropriate reactions.



17-20. Balance the following reactions:



18. When heated, the DNA double helix separates into two random-coiled single strands. When cooled, the double helix is re-formed:

double helix \rightarrow 2 random coils

What is the sign of ΔS for the forward process? Why?

+ ; dissociation of a dimer

19. Write the following in the order of increase of entropy:

vapor (120°C), liquid water (10°C), liquid water (70°C), ice, vapor (300°C)

20. A reaction has $\Delta G > 0$ at some conditions. Is it at equilibrium, will it go forward or reverse?

reverse